

# THE IRON AGE

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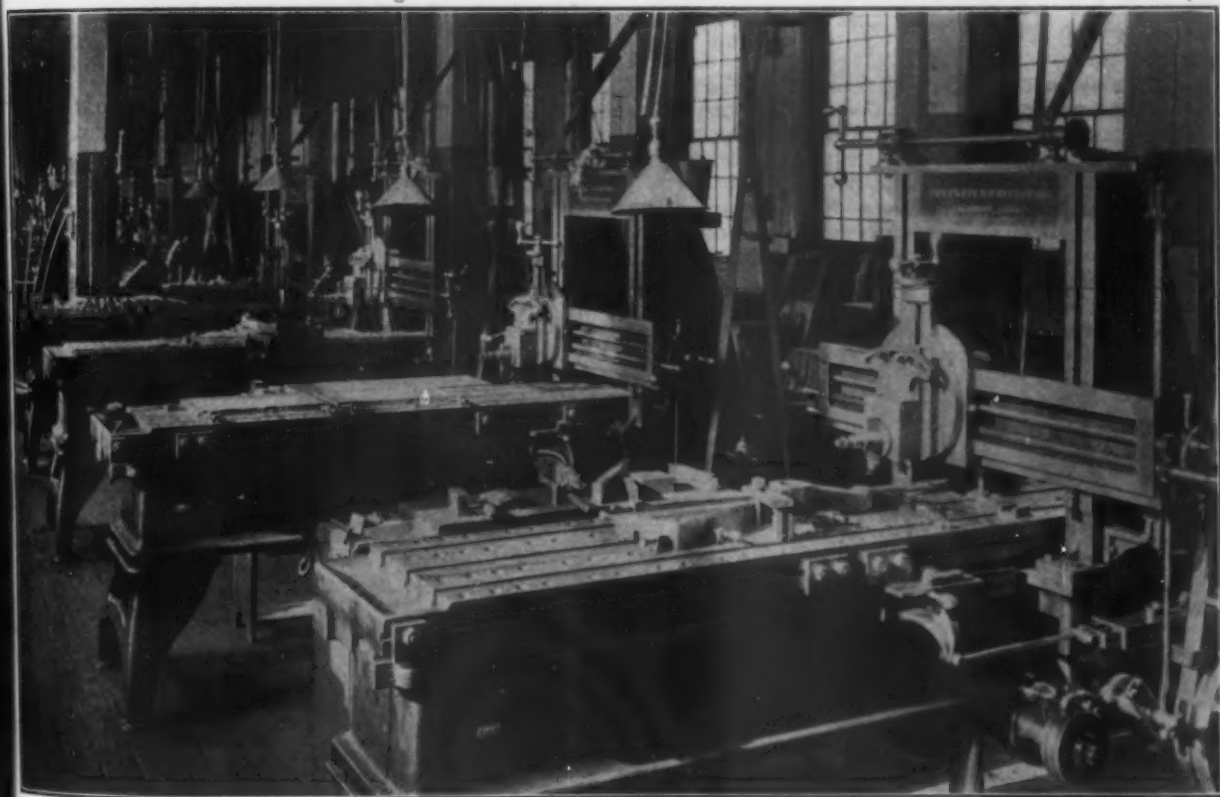
## No Hand Scraping on Planed Work

Accuracy and Long Life Secured with Reduction in Labor Cost  
—Special Fixtures to Hold Strips for Planing—Two-  
Bit Tool Holder Saves 25 to 50 Per Cent

BY L. S. LOVE

THE question of planing metal parts for exact fits without the necessity of hand scraping has been given considerable prominence lately. Advocates of the method claim for parts so planed a better fit and long life in addition to a decided saving in labor costs; those demanding hand scraping after planing claim it

to metal to metal contact. To overcome this difficulty on large planers, where the combined weight of the table and job are high, a mixture of cylinder oil and ordinary lubricating oil has been found effective, the heavier oil tending to stick to the surface. Also forced lubrication, through a pump delivering oil through tub-



Planers 25 to 40 Years Old, Partly Through Proper Maintenance, Produce Accurate Work

to be necessary to provide, through scraped depressions, pockets for oil for lubrication, if there is motion between the planed parts. This latter contention appears not to be borne out by fact.

The Sigourney Tool Co., Hartford, Conn., whose product is book stitching and binding machinery and sensitive drill presses, has largely to thank its planer work for its reputation and ability for accuracy. The company has found that too thick a film of oil or too much oil in the ways of a planer will detract from the accuracy obtainable. We know that in handling very large work, a thin film of oil in the planer ways will squeeze out and cause the table to jump or chatter due

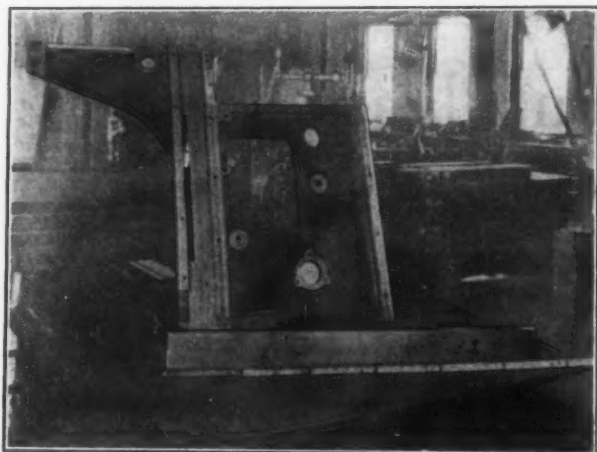
ing to the ways at close intervals is frequently used. These methods, however, do not apply on small or average sized work.

### Battery of Old Planers Doing Unusual Work

One of the illustrations shows a battery of planers in the Sigourney shop ranging in age from 25 to 40 years. These machines have ways, vees, heads, clapper-boxes, rails and housings planed to size, and consequently to fit, without scraping; the only hand work on them has been to remove the fuzz or loose metal left by the tool. The practice generally is to replane parts of new tools purchased. These machines to-day, after

their many years of service, are still accurate and are producing planed work to limits usually expected only of grinding machines or precision tools. Of course, it must be understood that in addition to accurate machines, it is necessary to have men who will take an interest in their work and have learned to produce a 1-in. block when they are told to, and not a block 0.999 in. or 1.001 in., as is so frequently the case.

Furthermore, the design and maintenance of the planer tool is of decided importance. For finishing, a



There Is No Provision Made for Adjustment in This Side Frame Bearing for the Head Clamp Bar. It is planed and fits with a full bearing, thereby prolonging life as compared with a scraped bearing which is regarded as bearing on spots

tool with an absolutely straight face, must be set properly in the tool holder. After the cutting edge of the tool is ground, it is stoned. It is held in a vise and the hone passed back and forth over the edge, in the manner of a file. These stones are kept flat and true, by rubbing on a cast iron bench plate with emery, and when not in use are kept in jars of kerosene to keep them clear of old oil and particles of steel.

Also the feed taken now for a finish cut is much coarser than formerly, when a fine feed was considered essential for a good job. The difference in feed was shown in the case of four pairs of parallel blocks. Some

when assembled, yet when the flanges are placed face to face, the hole through must permit free operation, without binding, on a vertical shaft; the slots on the edges must line up to take the guide bars, and the slots in the faces must line up to carry the radiating arms. These latter, being about 30 in. long, must fit absolutely, as any error would be greatly multiplied in their length. The two halves of the coupling can be put together in any one of the four possible positions, with uniform fit of the inserted bars in any of them, and all with no scraping.

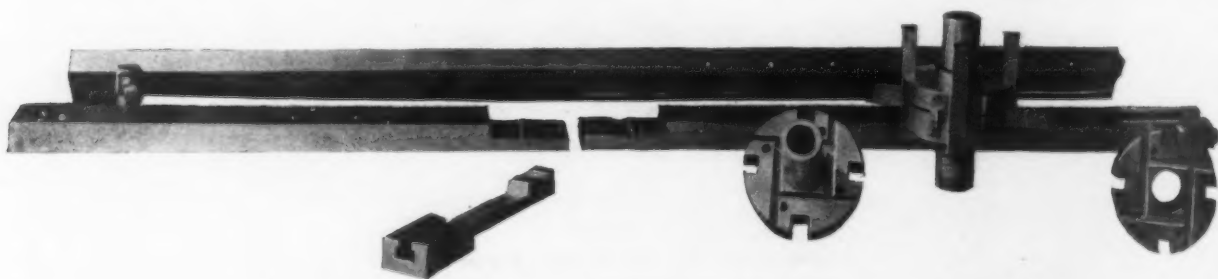
Another example of uniform accuracy is also shown. This is a small cast block with a T-slot in which is inserted a short cast bar. These parts are made up in lots of hundreds; are all planed and not scraped; yet any bar must fit accurately any block.

The fold bars shown in this same illustration are made in two parts. One half has a slot which is a cam track; the other half is plain. They are made in two pieces for ease of planing the cam track. A joint is then planed with an integral key in the plain end and the two pieces fitted together and held with fillister head screws. It can readily be seen from the illustration that this planed joint, without any scraping, scarcely shows in the finished fold bar, and the edge of the bar, composed of two pieces, is entirely straight and flat.

Larger work as well as small parts are planed with equal accuracy. One illustration shows the side frame of the book casing machine, a machine used to glue board covers on books. Each side frame supports in a long slot a rectangular bar about 35 in. long, which has a vertical movement and operates the head clamps; this is a part of the machine which clamps on the back of the book, after the cover is glued and put in place. The way in which this bar travels and the bar itself are planed, but not scraped, and there is no gib nor other provision to compensate for inaccuracies; yet the fit is so close there is no looseness, and the lasting qualities of such a bearing are proved by the fact that this part, receiving almost continuous motion in the operation of the machine, shows no appreciable wear after years of service.

#### Thin Strips Planed Within 0.00025 in. of Parallel

A most interesting development in the use of planers in the Sigourney plant is the production of thin narrow strips, which are made in a variety of sizes for use in



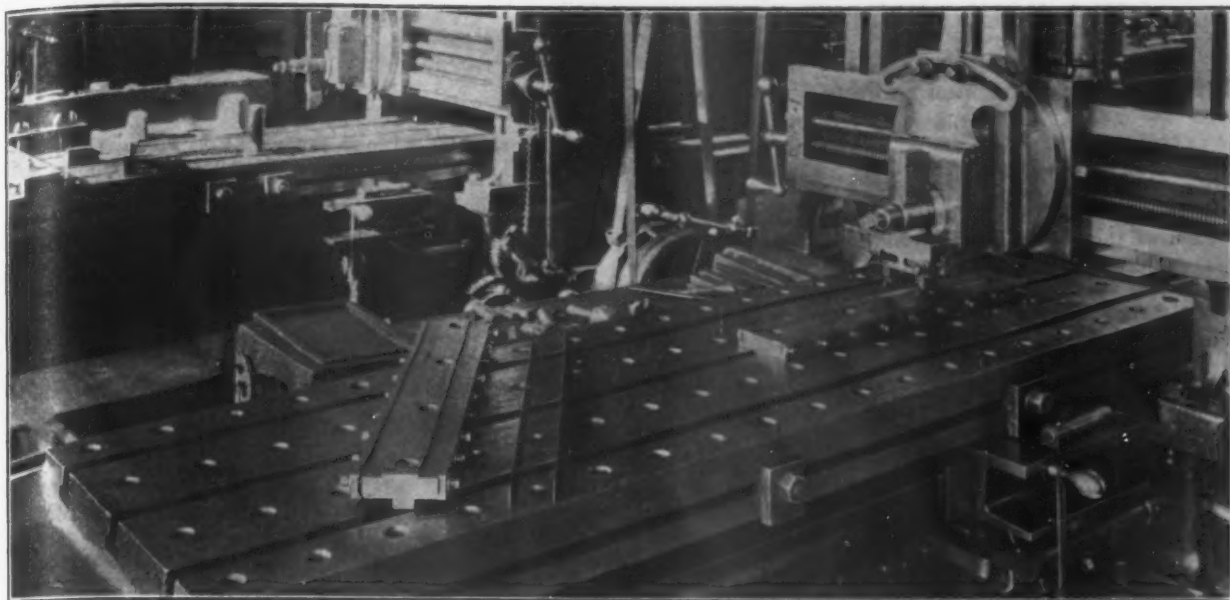
Work Planed and Not Scraped, Interchangeable Without Play or Shake

of the blocks made within the last five to ten years showed the wide feed marks. The other blocks, which were about 30 years old, showed the old method with the fine feed. None of these blocks have been scraped, and yet it is possible to take any three pairs and have them parallel within 0.00025 in. Angle plates and other fixtures in use in this shop are planed without scraping to an equal degree of accuracy.

To give an idea of what can be done with accurate planing, probably the most outstanding example in this shop is a coupling used in one of its book machines. As can be seen in another illustration, the flanges composing the two halves of this coupling have four slots cut in their edges, and four in their faces. These slots are all planed, without reference to their relative positions when assembled, by being held on angle plates in the planer. The coupling is also shown assembled. As stated, in planing these flanges, no reference is considered as to the relative positions of the various slots

different parts of the company's product. For example, strips 18 in. long,  $\frac{3}{4}$  in. wide and 0.042 in. thick, are planed in pairs in the fixture shown, with a tool holder carrying two bits. A roughing and a finishing cut are taken on this work, the finished pieces being within 0.00025 in. of parallel. The fixture consists of a cast plate with a tongue to fit into the T-slot of the planer table. In the top center of the plate is an integral clamping strip against both sides of which the work is held by adjustable side clamps. These latter are so arranged that they are drawn in and down against a beveled edge at the bottom of the fixture plate, thus not only clamping against the side of the work, but also drawing it down against a firm seat on the fixture. Different thicknesses of strip are planed by use of packing strips of different thicknesses set under them; the thicker the work, the thinner the packing strip. While the set screws in this fixture are provided with square heads for a wrench, the work can be held sufficiently





Accuracy in Planing Strips as Thin as 0.042 In. Is Found Possible Within 0.00025 In. in 18 In. When Proper Tools and Work Holding Fixtures Are Used

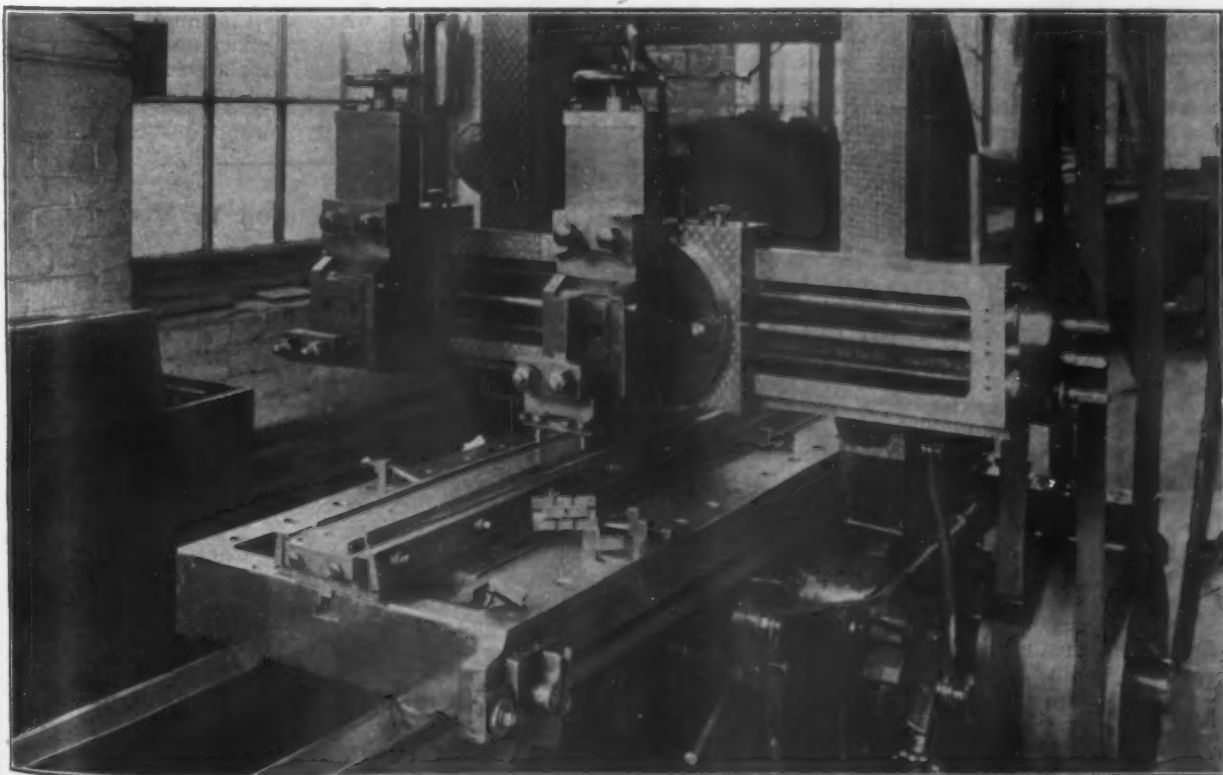
tight by simply drawing the screws snugly up by hand.

One reproduced photograph shows a different kind of fixture used with a double bit tool holder for planing a different form of strip; the particular work in the machine at the time the picture was taken was brass. It will be noted, that the clamps in this fixture are different from those in the preceding job, being of an L-shaped section. Along the lower edge of this clamp is a bead which fits into one of several grooves in the base of the fixture, the groove used depending upon the width of the work. Also different sizes of clamps are used varying with the work to be done. An accompanying sketch shows the section of the clamp.

Referring again to the photograph, the design of this two bit tool holder will be found of interest. The distance apart of the two bits is adjustable, the blocks holding them riding on a dovetailed seat in the holder itself. The shanks of the bits are finished exactly to size and fit in their individual holding blocks, the reason

for this construction being that they may be held rigidly in position and not shift due to side pressure. In order that the rake and clearance of cutters may be properly controlled, after the shanks are finished, they are inserted in a machining fixture with slots at the desired angle, so that shaping and grinding of the cutting edges may be done parallel with the sides of the grinding fixture, and yet present the correct rake and clearance angles to the work when they are set in the tool holder. For clearer understanding this bit holding fixture is shown on the planer table almost directly under the tool holder; also two bits are shown beside it. This two-bit tool holder is provided with oil holes, so that oil may be fed through it to the cutting edges of both bits when desirable.

The use of this type of tool holder on work up to 4 in. in width saves 25 to 30 per cent over a two head planer on similar work, and is 50 per cent faster than a single head planer.



A Two-Bit Planer Tool Holder Saves 25 to 30 Per Cent as Compared with a Two-Head Planer and 50 Per Cent as Compared with a Single-Head Planer on Work Up to 4 In. Wide

## OHIO FOUNDRYMEN DINE

### School for Training Men at State University Proposed—Association Growing

The annual meeting of the Ohio State Foundrymen's Association was held at the New Manchester Hotel, Middletown, Ohio, Dec. 7 and 8. A very good representation of the membership attended, and some interesting papers and discussions were heard. The election of officers for the coming year, and completing of plans for a membership campaign were the principal items of business, followed in the evening of Thursday by the annual banquet with an instructive address by F. D. Chase, Chicago, on "Modernizing Your Present Foundry."

Kenyon Riddle, city manager, welcomed the delegates to Middletown, and in discussing the benefits of community spirit and association, referred to the city in which they were meeting, which last year raised a fund of \$1,000,000 among its citizens for civic purposes.

Mr. Riddle's address was followed by the reports of the officers. President Huber briefly reviewed the work accomplished during the past year, and outlined what he thought should be the aim of the association during the coming one.

#### Progress of Association

Secretary Tuscany's report showed that 35 new members had been added to the roster during the year, and indicated that next year the membership, with a little intensive individual work on the part of the members, could be more than doubled. Nearly 200 foundries scattered throughout the State are now enrolled.

During the past year, the cost work of the association had been greatly extended, and many of the members had been brought into line on the uniform trade customs of the organization. A consulting actuary had been engaged to handle compensation matters, and a special credit service secured at nominal cost. The scope of the trade report had been broadened, and a department for special services to members had been opened. The association had also made great strides in its statistical services, and had added a complete library dealing with foundry problems which is accessible to any member.

George K. Elliott, metallurgist of the Lunkenheimer Co., Cincinnati, read a paper on "The Relation of the Electric Furnace to Cast Iron." Mr. Elliott described some of his company's experiences in duplexing, and described some of the advantages of the electric furnace working in conjunction with the cupola. He did not recommend the electric furnace as a cure all for the foundrymen's troubles, stating that it was his belief that in ordinary foundry practice, nothing had yet been developed that would take the place of the cupola. But where special work, and high-grade castings were concerned, the electric furnace could be used to good advantage, as with an electric furnace it is possible to control the elements in any way desired. Following the reading of the paper, a general discussion brought out the fact that in many places, perhaps in the majority, the cost of melting with an electric furnace would be economically prohibitive, but that in certain cases the extra cost would be more than justified in the production of certain types of castings.

Pat. Dwyer, Editor of *The Foundry*, gave an interesting talk on "Sidelights of Cupola Practice," gathered from his own experiences in shops, and also gave a resume of what is being accomplished in the matter of more efficient cupola handling in some of the shops of the country.

A. J. Tuscany, secretary, discussed "Foundry Operation for a Profit," in which he gave some concrete illustrations of the methods employed by some buyers in securing low-priced castings, and warned the members to thoroughly investigate statements made to them of ridiculously low prices before taking any action to meet them.

J. H. Thompson of the Dayton Pneumatic Tool Co.

had an interesting paper on "The Proper Maintenance of Pneumatic Tools," showing what an expensive proposition badly kept tools may become.

#### Developing Foundry Material

J. H. Hogue, French Foundry Co., Piqua, Ohio, discussed "The Labor Situation—Developing Foundry Material." Mr. Hogue described some of the foundries connected with educational institutions, and gave an outline of the courses followed, which he thought entirely inadequate when the importance of the industry is considered. He did think, however, that the people in charge were doing wonders when the equipment was considered, but that much more could be done if a foundrymen's association could be interested. He advocated the establishment of a school for training men in connection with Ohio State University for advanced students in engineering, and that a student majoring in foundry practice be given a degree of foundry engineer. Modern and up-to-date buildings and equipment should be supplied, and foundrymen of the State should supply the funds and be the directors of the school. The school could also be used for experimental purposes. The people in charge at the university were very much in favor of such a school, and were patiently waiting for the State foundrymen to give them the necessary co-operation to make the school a thoroughly practical one.

President Huber described the system of education and training given at the foundry of the American Rolling Mill Co. It was suggested that the association should take steps to have the number of apprentices in the shops increased, as at the present time there are not sufficient molders to go around even with the industry as a whole operating at a 60 per cent rate. The whole subject was deemed of such importance that a committee was appointed to go into it thoroughly and report at next meeting.

F. W. Huber, Middletown; Walter Seelbach, Cleveland; G. W. Piehl, Cincinnati; W. E. Matthews, Bucyrus, and L. H. Wise, Zanesville, were elected directors for the three-year term. The directors organized by electing Mr. Huber president; J. H. Bruce, Cleveland, vice-president; Walter Seelbach, treasurer and A. J. Tuscany, Cleveland, secretary-manager.

On Friday the delegates were taken on an inspection trip through the plant of the American Rolling Mill Co., followed by a luncheon at the Armco dining room as the guests of the company. The members later drove to Cincinnati, where the Cincinnati members entertained them during the afternoon and evening.

The selection of the meeting place for next year will be made at the next meeting of the board of directors of the association.

### Foreign Trade Convention to Meet in New Orleans

The tenth national foreign trade convention of the National Foreign Trade Council, of which James A. Farrell of the Steel Corporation is president, will be held in New Orleans on April 25, 26 and 27, 1923. O. K. Davis, secretary of the council, says that "the selection of New Orleans as the convention city is peculiarly fitting in view of the development of the city as a great center of American foreign trading activity. Of special interest to foreign traders in all parts of the Mississippi Valley has been the development of shipping facilities at the port of New Orleans, and the consequent increase in steamship services. Since the third national foreign trade convention was held in New Orleans in 1916 this progress has been particularly marked, and has been accelerated by the increasing proportion of American foreign trade carried on with the West Indies, Central America, Mexico, South America and Asia, much of it passing through Gulf ports. As in former years, leading foreign traders from every part of the United States and every line of industry, as well as a considerable number of business men from foreign countries, will be in attendance at the convention."



# E. J. Buffington Explains Pittsburgh Base

Custom in Steel Trade Declared a Natural Development  
Similar to Those in Other Industries—Change  
May Come in Chicago Territory

**E.** J. BUFFINGTON, president Illinois Steel Co., has written an explanation of what the Pittsburgh basing plan is, comparing it to similar methods as to other products, especially wheat and sugar. Mr. Buffington says:

"A clear understanding of the subject requires that it first be defined. It is necessary that we should have clearly in mind not only what it is but what it is not.

"What is commonly called 'Pittsburgh basing' or sometimes 'Pittsburgh plus' means this: Sometimes a producer of steel at a point distant from Pittsburgh sells his steel at various points for a price which is the sum of the price of such steel at Pittsburgh plus the freight to those points. Stated more concretely, for many years past the prices of some steel products in Chicago have commonly, although not always, been the sum of the prices of such products at Pittsburgh, plus the freight from Pittsburgh to Chicago.

"Such 'Pittsburgh plus' places are not the result, as is so many times assumed or implied, of the adoption of a 'plan' by any manufacturer or group of manufacturers. No one has adopted an artificial or arbitrary method of fixing prices. On the contrary, 'Pittsburgh plus' prices are the natural result of the free play of economic forces. The 'Pittsburgh plus' prices at all places are the natural market prices at those places.

## "Pittsburgh Plus" Defined

"'Pittsburgh plus' or 'Pittsburgh basing' has come in the common mind to have reference to the price of steel. Exactly similar price conditions, however, apply to grain, sugar and a great many other commodities. In discussing 'Pittsburgh plus' or 'Pittsburgh basing' we are discussing merely one specific illustration of the effect of many producers on the one side attempting to sell their products and many purchasers on the other side attempting to buy those products, all under varying market conditions.

"Since the beginning of the manufacture of steel in the United States the Pittsburgh, Pennsylvania, district has been and continues at the present time to be the largest steel district in the country. If one desired to purchase steel for use in Chicago when no steel was produced in Chicago, the cost of such purchase was then the price of steel in Pittsburgh plus the freight to Chicago. In other words, the price was a 'Pittsburgh plus' price.

"When Chicago began to produce steel, but in quantities insufficient to supply the demand in Chicago, then the purchasers in Chicago were still compelled to get part of their steel in Pittsburgh. When they bought steel in Pittsburgh, the cost to them at Chicago was the Pittsburgh price plus the freight to Chicago. In other words, the price was 'Pittsburgh plus.'

## Basis for Prices

"Under these conditions, if a purchaser of steel in Chicago offered to buy from a manufacturer in Chicago, when, as stated, the manufacturers in Chicago were able to produce and furnish only a part of the demand in Chicago, what would the price naturally be? Taking into consideration practical trade conditions, what would the price be? Why, if part of the purchasers of steel were obliged to go to Pittsburgh for their steel and pay the Pittsburgh price and then pay the freight from Pittsburgh to Chicago, that established the market price in Chicago. The Chicago producer could readily get a price which was the same as the cost to the purchaser who obtained his steel in Pittsburgh, that is to say, the Pittsburgh price plus the freight from Pittsburgh to Chicago.

"As stated above, the Pittsburgh district is the largest steel producing district in the country. No other district in the United States produces a sufficient amount of steel to supply the adjacent country under normal trade conditions. Therefore, all districts in the United States are generally dependent upon the Pittsburgh district for some part of the steel which they require. Naturally, then, not as the result of any artificial plan, but as a result of the free play of the laws of supply and demand, the prices in these districts come to be the prices which equal the sum of the Pittsburgh prices plus the freight.

## Chicago Basis to Come?

"Of course, if the time ever comes when the Chicago district produces a surplus of steel so that the entire demands of this district are supplied by steel produced in Chicago and the surplus presses out toward Pittsburgh, or in other directions, the prices of steel at Chicago cannot be 'Pittsburgh plus' prices. Under those circumstances, Chicago will establish its own prices.

"An illustration of this may be found in the actual experience of the trade recently. A year or so ago the demand for steel fell off to such an extent that the producing capacity of the Chicago district exceeded the demands of that district. Quickly the prices in Chicago fell below the prices in Pittsburgh plus the freight.

"In substance, the prices of steel in the regard we are considering are not different from the prices of grain. There is always a market price for grain in Chicago. Vast quantities of grain come into Chicago from the fields where produced, and are then distributed from Chicago to points of consumption. The great mass of wheat is produced west of Chicago and consumed east of Chicago.

"The price paid by grain dealers at the various points west of Chicago, where wheat is produced, is day by day the Chicago price less the freight from the point of purchase to Chicago. The price of wheat east of Chicago is the Chicago price plus the freight from Chicago to the given point. In neither case does the cost of producing the wheat west of Chicago or the cost of producing the wheat east of Chicago fix the price. The market price at Chicago fixes the price in both localities.

## Sugar Prices Compared

"The price of sugar furnishes another illustration of the subject. The United States does not produce sufficient sugar to supply its needs. In consequence, large quantities of sugar are bought in Cuba. The prices for sugar which rule in different parts of the United States bear a direct relation to the prices of sugar at seaboard points, such as New York, Baltimore, Galveston and elsewhere.

"It may be laid down as a general rule that the district in which the greatest quantity of the products named or other products similarly affected by market conditions are produced or marketed establishes the market prices for such products and becomes a basing point for the prices of such products in other districts.

"It appears that the Western Association of Rolled Steel Consumers is exploiting a desire and purpose to provide, preferably by Government regulation, prices of steel products which they purchase upon some basis more favorable to them than the prices which prevail under normal market conditions. So far as we know, the Western Association of Rolled Steel Consumers is not advocating a like government regulation of the prices at which its members sell respective finished products."

## FAVORS SHIP SUBSIDY

### Strong Arguments Made by the Chamber of Commerce of the United States

WASHINGTON, Dec. 12.—The Chamber of Commerce of the United States has taken an active interest in the ship subsidy legislation and Vice-President Elliot H. Goodwin in a letter to members of the Senate has stated that America's position as second maritime nation of the world cannot be maintained without the grant of aid to present and prospective ship owners. This endorsement of the Administration's ship subsidy bill from the chamber, it is hoped, will give the measure added strength because it is obvious that it faces a difficult fight in the Senate. At the time of sending the letter the chamber also issued an interesting pamphlet entitled "Why a Merchant Marine?" The pamphlet sets out reasons why a privately owned merchant marine is a national necessity and at the outset stresses its importance as a matter of national defense. After dealing with this subject, it is pointed out that should the present period of business depression be followed by a decline in American shipping or even by a serious postponement of its development, the shipyards in the United States will greatly suffer and probably many of them will go out of business. This, it is stated, will be a serious misfortune, since these yards are necessary to national defense as well as to the healthy development of a merchant marine.

#### The Economic Reasons

The report then takes up the economic reasons for the establishment of a merchant marine and states that they are various. Shipping under the national flag, it is stated, and an adequate tonnage of vessels of different types are in fact essential parts of the trade facilities, an organization with which the people of the United States will be able to extend their commerce to all sections of the world. In other words, it is stated, if we are going to succeed in foreign trade, not only our wares must compare favorably with those of our competitors but our service as well, of which shipping is an important part. It is pointed out that not so very long ago only 12 per cent of American exports consisted of manufactures. To-day that proportion is 30 per cent or more and during the war it was considerably higher. "The product of our expanded industries, taken as a whole, is so much greater than our national requirements as to create a serious situation, that will be reflected on every farm and in every shop, and in every home as well, unless markets for the surplus can be found abroad," says the report.

It is pointed out that last year American exports totaled \$4,485,122,696, and American imports \$2,529,025,403, and that there is not a State in the country that does not make a contribution to our export trade. It is declared that an analysis made of a cargo recently shipped to South America from a Southern port disclosed that practically every community in the United States, manufacturing and agricultural, had a part in the production of that cargo.

#### Importance of Foreign Trade

"But, it is asked by the uninformed, why emphasize the importance of our foreign trade?" the report says. "It is only a fraction of our total trade, and the loss of it could easily be offset by a well-directed expansion of our domestic trade. One of our half dozen greatest manufacturers has pointed out that the last fractional part of a given industrial production often represents the profit of the whole output, and that a market for the last part, outside the saturated limits of our domestic market, is essential to the success of the manufacturer's venture. Furthermore, while in some industries the percentage of product exported is not large, it is to be kept in mind that of cotton, wheat and copper from 20 per cent to 30 per cent and even 50 per cent is exported."

To show that the United States is not a self-contained nation, the report points out that it is necessary to import many products, such as nickel from Canada

and New Caledonia, tin from Malay Straits and Bolivia, vanadium from Peru, rubber from Brazil and the Far East, raw silk from China and Japan, etc.

It is pointed out that it is necessary for American interests to employ American vessels and that no sane merchant would permit competitors to deliver his daily sales even if the competitors would offer to do it more cheaply. There is a psychological element in the relation of seller and buyer which every dealer in commodities realizes and which is greatly diminished if not wholly lost by the employment of a competitor as an intermediary at any point between purchase and delivery. This business principle applies to deliveries by ship and ships entering ports of the world flying the American flag advertise to the nations that these vessels are the delivery wagons, so to say, of our country's commerce.

#### Becomes a Drummer

"Not only that," it is pointed out, "but a laden vessel sent to a foreign country becomes a drummer there, or a trade missionary, not only for the sale of the goods carried out, but for cargoes to bring back. If there is not at hand a cargo to bring back, the shipowner seeks one, may even buy one if it can be obtained in no other way. The return cargo may be something which can be sold here in the United States at a profit representing reasonable freight rates. In this way the owner gets his freight charge and establishes a new trade. Also, American ships visiting foreign ports lead to the establishment in those ports of American branch houses fighting for a portion of the carrying trade for American ships, and for the participation of American merchants in the world's business. Foreign agents will not work full-heartedly for American interests, especially when in so doing they will be working against the interest of their own nationals."

The report, handling the subject from a point not generally brought out, states that in 1920 the United Kingdom's net national income from shipping, as estimated by a leading English journal, was £340,000,000. This is pointed out to show that, while England always has had a balance of trade against her, this balance in the exchange of commodities has been corrected by her "invisible exports," that is, the interest on her loans and investments abroad and by her freight money. It is stated that if the goods are carried in an American ship the freight money is retained here and the profit in the transaction is added to the nation's wealth.

### Austrian Trade in Critical Condition

VIENNA, AUSTRIA, Nov. 24.—The decline of the German mark and the improvement in the Austrian krone have led to an acute crisis in Austrian commerce and industry. Demand has greatly receded and orders have fallen off very suddenly. Unemployment is growing and some firms financially unsound are even forced to emergency sales of goods in order to provide for the necessary working capital. The position in the coal industry is especially critical and as much as one-third of the men have been dismissed lately. Upper Silesian coal is coming into the country at a price with which neither Czechian nor Austrian firms can compete. In the iron and steel, and in the metal working industry, conditions are similarly discouraging and quite a number of factories are working on short time. The electric industry is still comparatively busy on large old contracts, but home and foreign trade in electrical appliances is slackening. In this line, as well as in machinery, tools, hardware, etc., Austrian firms find it impossible to meet German prices. It was expected that the decline in the German exchange would swamp German works with orders again, and that German competition would consequently be kept out of the home market. Just the contrary has taken place, and the position of the Austrian industry is very unsettled.

The North & Judd Mfg. Co., manufacturer of hardware, New Britain, Conn., has re-opened its plant at New Haven, Conn., formerly the Fitch factory, and a large number of molders are employed.



# Coke Oven Gas in Open-Hearth Furnaces

## A French Discussion of Various Methods of Using This Gas—Effect of Heating— Use of Mixed Gases

**A**N interesting and thoughtful article by Jean Dupuis appears in the *Revue de Metallurgie* for October, on the use of coke oven gas as fuel for open-hearth furnaces. This paper was presented at the recent congress at Liège held in June, and the writer is evidently connected with the Saint-Jacques plants of the French firm of Forges de Chatillon, Commeny et Neuves-Maisons.

The main advantage in using this gas as fuel for the open-hearth is to help in the proper use of coal. If a standard European steel plant is considered as comprising essentially blast furnaces, basic Bessemer, rolling mills, coke ovens sufficient to supply the blast furnaces, and an open-hearth large enough to absorb the Bessemer steel scrap, then the heat balance of such a plant shows that it should be possible to require raw coal only at the coke ovens. The excess of blast furnace and coke oven gas together with the coke breeze, etc., are sufficient to satisfy all the needs of the plant for power and heat. It is evident that the realization of such an ideal would give both the minimum use and proper use of coal because all of it would pass through the by-product ovens.

The gaseous fuels available in the order of fuel value, are blast furnace gas with a minimum of 106 B.t.u., gas from producers burning coke with 123 B.t.u., gas from ordinary gas producers with 146 B.t.u., and coke oven gas with 450 B.t.u. To properly portion out these fuels a consideration of both quantity and fuel value is necessary, that is to say, it is necessary to furnish to each apparatus the heat that it needs in a given time, and in such form that the necessary temperature can be reached for proper operation. The open-hearth offers the most difficult problem, and among metallurgical apparatus using exterior fuel requires the highest temperatures.

The theoretical temperatures of combustion in the open-hearth of the gaseous fuels mentioned above are given below. It is assumed that the air is preheated to 1000 deg. C., and the necessary known excess is used sufficient to give complete combustion in the laboratory of the furnace. Also that the gas is preheated to 1000 deg. C., except the coke oven gas, which for reasons given below is not preheated. Under these conditions the temperatures in round numbers are:

1850 deg. C. for blast furnace gas	(3360 deg. Fahr.)
2000 deg. C. for coke producer gas	(3630 deg. Fahr.)
2100 deg. C. for coal producer gas	(3810 deg. Fahr.)
2300 deg. C. for coke oven gas	(4170 deg. Fahr.)

The minimum temperature necessary to operate an open-hearth furnace may be said to be the temperature reached with present practice, that is to say, with ordinary producer gas. This is not strictly true because persevering efforts have been made in Germany to use coke producer gas and similar tests have been carried out in France at Montluçon. The results are concordant; the furnace can be operated but it is not practicable because the time of heats is too long. It would seem then that a temperature of combustion of at least 2100 deg. C. is necessary and, to reach this temperature, coke oven gas must be used either alone or in mixture, if producer gas is not employed.

It is believed coke oven gas was first used in the United States in 1906 and at Hubertushütte in Upper Silesia in 1907. But in 1909 at the Cockerill works in Belgium and at Mulheim-Ruhr in Germany the matter was taken up systematically. Since then many applications have been made at different plants comprising not only the use of coke oven gas alone or with tar, but also in admixture with the other three gases. All these combinations are possible, all are practicable and

justified by the particular conditions of the individual plants.

Part of this question may be discussed now, namely, the very interesting application of coke oven gas alone (or with tar), and the use of mixed coke oven and blast furnace gas. Both methods allow the elimination of gas producers thus simplifying greatly the design of the open-hearth plant and bringing about a marked saving.

### Two Methods of Using the Gas

These are the two methods most used. Unfortunately they are not always possible, because one can only be used in plants with blast furnaces and the other requires large amounts of available coke oven gas. It is easy to calculate that it is necessary to carbonize about three tons of coal to have enough gas to make a ton of steel, when the coke ovens are heated with their own gas. In other words with the usual European battery of 40 ovens taking 8 tons each, the excess gas is just enough for a 25-ton open-hearth furnace making heats every six or eight hours. This shows how interesting it is to consider heating coke ovens with poorer gas, which is easily possible because the temperatures required do not exceed 1200 deg. C. From the successful tests already made it would seem that heating coke ovens with blast furnace gas should become the rule in plants installed near blast furnaces. This would give more opportunity to develop the use of coke oven gas in metallurgical apparatus, particularly the open-hearth.

The first applications of coke oven gas were naturally made with existing arrangements, such as used for ordinary producer gas. It was soon found that during passage through the regenerators it suffered a marked loss in heating value. The principal changes consisted of loss of heating power and of density, increase in volume, decrease in total weight and in total heating value. Analysis showed a decrease in percentage of hydrocarbons and an increase in hydrogen, so that the results were due to dissociation of hydrocarbons at the temperature of the regenerators. After separation of benzol the coke oven gas contains about 2 per cent olefines and 25 to 35 per cent saturated hydrocarbons which supply more than half of the heating value. The olefines dissociate at 600 deg. C., the saturated hydrocarbons commence at 900 deg. C. and their dissociation is intense and rapid at 1000 deg. C. In addition to the changes mentioned above there are also deposits of carbon formed on the arches, flues and bricks of the checker chambers, which deposits naturally greatly affect the efficiency of the regenerators.

Careful laboratory tests, confirmed by work in the plants has shown the following:

1. Changes are brought about in coke oven gas by reheating which are more important as the temperature is increased, the time of heating is prolonged, and the gas is higher in hydrocarbons.
2. The percentage of heavy hydrocarbons, methane and carbon-dioxide decreases.
3. The percentage of hydrogen and carbon-monoxide increases.
4. The volume of gas increases. Not only does its density decrease but its total weight also is lessened.
5. The calorific power of the gas decreases more rapidly than the volume increases.
6. The decrease in percentage of heavy hydrocarbons is most marked between 600 and 900 deg. C., that of methane begins at 900 deg. C., and that of carbon-dioxide at 1000 deg. C. The decrease in total weight of gas is caused by the deposition of carbon, and as shown below this is the only real cause of loss of heating power.

A simple solution would seem to remove all the difficulties, namely, not to heat the rich gas. Why is pro-

ducer gas heated? For two reasons: First, to be able to reach the temperature of combustion necessary to operate the process, and second, to bring about required regeneration because the gas represents at least 40 per cent of the volume entering the furnace and if reheating is not carried on the waste gases would carry to the chimney an excessive proportion of heat units.

These two reasons lose nearly all their force when rich gas is considered. The temperature attained by combustion of the cold rich gas has been shown to be amply sufficient for furnace operation because it exceeds by 200 deg. that obtained from heated poor gas. Also the gas represents only 15 per cent of the volume entering the furnace and reheating can be applied to the air alone, and still sufficient regeneration be obtained.

#### Practical Applications

This method has been adopted practically with good results. Not only have the inconveniences of preliminary heating disappeared, but the construction of the furnace has been considerably simplified. Two regenerators instead of four, elimination of gas flues and uptakes, change of the end construction to a single air passage, the gas being introduced by a metal burner suitably water cooled. In regard to production the Cockerill plant at Seraing, Belgium, to which work reference is always made when coke oven gas is mentioned, published results in 1913, showing an increase of 25 per cent with a decrease of 30 per cent in consumption of pig iron, in an open-hearth changed in a simple manner.

This important increase in output came first from the difference in temperature of combustion, which is about 2300 deg. C. for coke oven gas against 2100 deg. C. for ordinary producer gas. This difference of 200 deg. seems relatively small, but it must not be forgotten that the useful effect of a fuel is measured by the heat that it can give to the surroundings which are to be heated. This is proportional (other things being equal) to the difference in temperature of combustion and the temperature of the surroundings. If 1700 deg. C. is assumed as the temperature of the open-hearth furnace then the difference is 400 deg. with ordinary producer gas and 600 deg. with the coke oven gas, which is an increase of 50 per cent.

This explains the increase in output, and also shows why there is such interest in the use of rich gas in the open-hearth. Unfortunately, as mentioned before, the

quantity available is often restricted, the rich gas is required for other uses such as gas engines and the heating and lighting of towns.

#### Use of Mixed Gases

When a proper supply of rich gas is unobtainable the question of mixed gases must be considered, and the problem of using a mixture of coke oven and producer gas is altogether different to that of the coke oven gas alone. The main question is whether it is sufficient to mix the rich gas with the producer gas, or whether special appliances are necessary. If coke oven gas is added before the gases enter the checkers then a homogeneous mixture is assured after passage through the windings of the checkers and the flues, but there is the danger of dissociation of the rich gas to be considered.

The writer then goes into this danger of dissociation at great length from a theoretical standpoint and gives the results of careful laboratory work on various mixtures. It was found that an addition of moisture to the gas mixture in proper amount would completely prevent deposition of carbon. If the rich gas is in excess in the mixture such a method cannot be used because such a large amount of water vapor is needed that the volume of gas is enormously increased, and the temperature of combustion is lowered so much that furnace operation would be impossible.

On the other hand if the amount of coke oven gas is sufficiently low, say not over 20 per cent, then carbon deposition can be prevented by having the proper amount of moisture in the producer gas. This conclusion was thoroughly proved in practice at the Saint-Jacques works. At this plant they had decided to use coke oven gas alone in certain of their open-hearth furnaces, but while waiting for the necessary changes in construction wished to use coke oven gas in the simplest manner possible. Following the laboratory experiments mentioned above, arrangements were made to add coke oven gas to the producer gas before entering the regenerators. The producer gas contains normally about 12 per cent water vapor and the amount of coke oven gas used was about 15 per cent of the mixture. This practice has been in force now for over a year and a half, there has been noticed a marked increase in the temperature of the furnace, without any abnormal deposits formed in the checkers or the flues.

G. B. W.

### Unemployment in Great Britain

The total number of registered unemployed in Great Britain on Nov. 20 was 1,379,000, an increase of 2000 over Nov. 13, and 12,200 over Nov. 5. It has been announced that the unemployment problem is to be considered the principal domestic problem before the new Parliament. During November alone, unemployment registration was increased by 50,000. The proposals for relief include an extension of the trade facilities act to £50,000,000, an expansion of the export credits scheme, and many local projects. The coal miners' wage problem is again a cause of contention.

### British Business Outlook Brighter

British business sentiment was greatly improved in November, says Commercial Attaché Walter S. Tower, in a cable to the Department of Commerce. Expansion in coal production and increase in the volume of iron and steel orders have had perceptible influences on the tone of the general industrial situation while many other factors have contributed to the present confidence in the situation, not least among which is the clearer political outlook both at home and abroad. The iron and steel industries have been taking on additional equipment. These interests expect a trade boom, notwithstanding the fact that some manufacturers of pig iron have found it difficult to sell their present full

production. The Welsh tin-plate trade also showed increased activities during the month. Continental competition was greatly lessened on account of exchange fluctuations. Prices of tin plate showed a steady tendency toward higher levels during the month.

During the week ended Nov. 18, British coal output was 5,376,000 tons as compared with 5,440,000 and 5,423,000 during the weeks ended Nov. 11 and Nov. 4, respectively. Dock congestion is again a serious handicap to handling exports.

### Receiver Appointed for Ferromanganese Company

David Halstead has been appointed receiver of the American Manganese Mfg. Co., Edward E. Marshall, president, by the United States District Court No. 4, Philadelphia, where the home offices of the company are located. Liabilities on merchandise are said to exceed \$500,000 and on notes \$2,000,000. The company has two blast furnaces at Dunbar, Pa., and is one of the country's largest producers of ferromanganese.

Last month the Truscon Steel Co., Youngstown, made larger shipments than in any previous November in the company's history, states President Julius Kahn. Heavy demand for construction materials such as the company produces, is reflected by the situation.



# Improved Wire-Galvanizing Equipment

Long Annealing and Spelter Pans and Unusual  
Capacity of Take-Up Frame  
Feature New Design

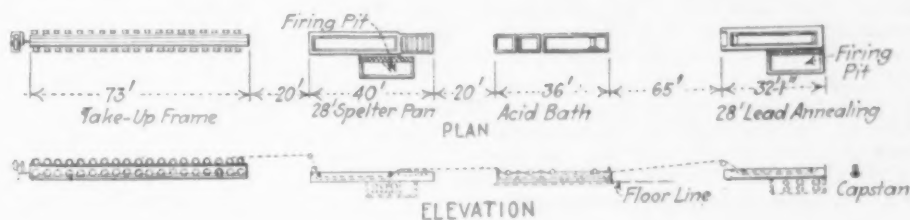
**G**ALVANIZED wire quality has been given considerable attention during the past few years, and to meet the more exacting requirements various improvements have been made in the equipment used in the manufacture of this wire. This is particularly true of telegraph wire, which is given a rigid inspection as to both its physical properties and its electrical conductivity.

Wire manufacturers make two grades of galvanized wire; fence wire and telegraph and telephone wire. Fence wire, after leaving the spelter bath, runs through asbestos wipers which remove the surplus metal, thus producing a smooth surface and finish

use of the single and larger pan results in a better and more even operation and is more economical. Fig. 2 shows a sectional view of the lead annealing furnace. The acid cleaning equipment through which wire passes after annealing and before galvanizing follows standard lines. The galvanizing equipment includes a 28-ft. spelter pan and an end-fired furnace. The latter is said to result in a marked saving in coal as compared with the side-fired type of furnace generally used. Fig. 3 shows the spelter furnace.

In galvanizing telegraph wire it is necessary that both annealing and the coating of spelter be uniform. This is accomplished in the new outfit by the design of

Fig. 1. Straight Line Advance of the Wire Is a Feature of the Layout of This Plant. The four main elements, and their relation to each other, are shown in the drawing



suitable for use in fence machines. After galvanizing it is given two or three one-minute immersions in a solution of copper sulphate. Telegraph and telephone wire is not wiped to remove the surplus spelter, as much as possible being left on the wire. This wire will stand seven or eight one-minute immersions in copper sulphate, although only four immersions are required.

A new telegraph wire galvanizing outfit, having a number of new features of which the outstanding one is that it has a convertible take-up frame so that it can be used for galvanizing either telegraph or fence wire, has been brought out by the Broden & Dailey Construction Co., Cleveland. One of these outfits is now being installed in the plant of a Canadian steel company, the plan of which, Fig. 1, shows a 28-ft. lead annealing pan. Common practice is to use two smaller pans, usually 16 ft. in length, but it is claimed that the

the take-up frame, shown in Fig. 4. The wire is pulled through the annealing and spelter baths by the drum A at a constant speed, which assures an even annealing and uniform coating of spelter. A variable speed motor regulates the speed for different sizes of wire.

The block B winds up the wire as it is delivered by the pull-out drum A, and as the bundle increases in diameter on the block, a friction slip C allows the block to slip and take up the wire only as fast as the pull-out drum delivers it to the block. An automatic distributor distributes the wire across the face of the block to assure a uniform bundle which will be compact and easy to handle. The outfit has forty drums and blocks, so that it galvanizes 40 strands of wire at a time as compared with a more common capacity of 32 to 36 strands.

As fence wire blocks are different in construction from telegraph blocks it is not necessary to have a friction drum to regulate the speed of the wire through the

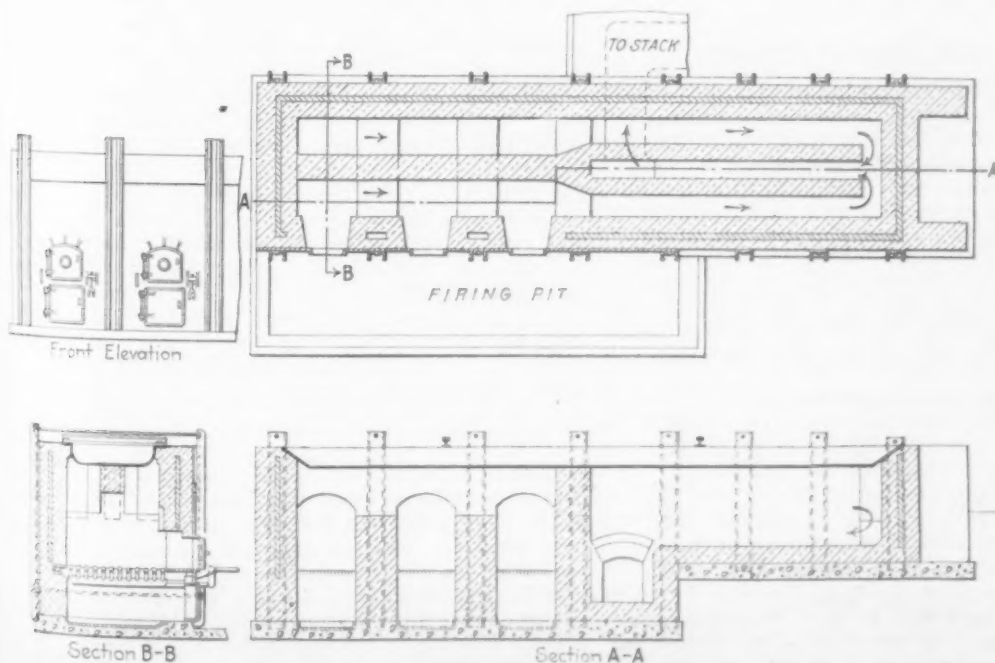


Fig. 2. Lead Annealing in a Pan 28 Ft. Long Is a New Development Which Is Expected to Prove More Economical Than with Two 16-Ft. Pans. Firing is from the side, while the hot gases travel the entire length of the pan and then double back for the half length at the outgoing (or cooler) end

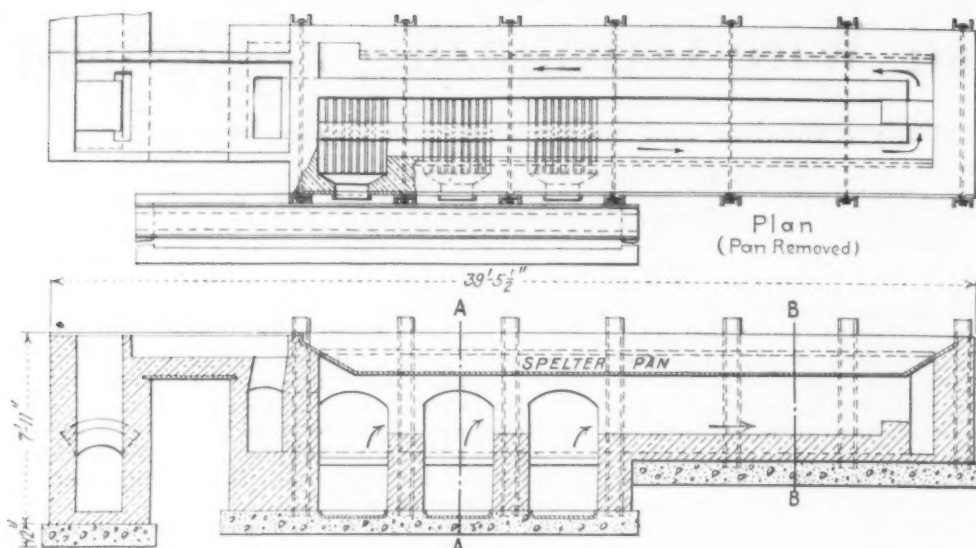


Fig. 3. As in the Lead Annealing Unit, the Spelter Pan Is 28 Ft. Long and Has Side Firing. The flue arrangement differs, however, as will be noted by comparing with the drawing on the previous page

lead and spelter baths. When fence wire is to be galvanized on the same frame the 40 telegraph wire-blocks, 20 on each side of the frame, are taken off and replaced with fence wire blocks. Then the friction drive is made a solid drive, being bolted with four bolts, and a small clutch is thrown out on the pull-out drum, allowing the drum to run as an idler. When the machine is thus converted for galvanizing fence wire the block B will pull the wire through the annealing and spelter baths and the pull-out drum A will merely act as a sheave to guide the wire onto the block B. It is

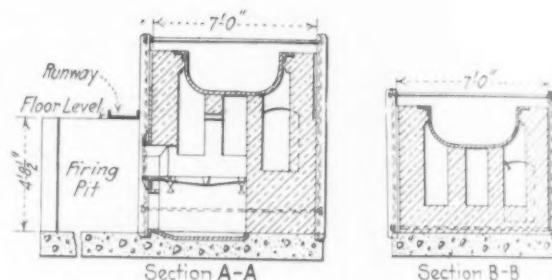
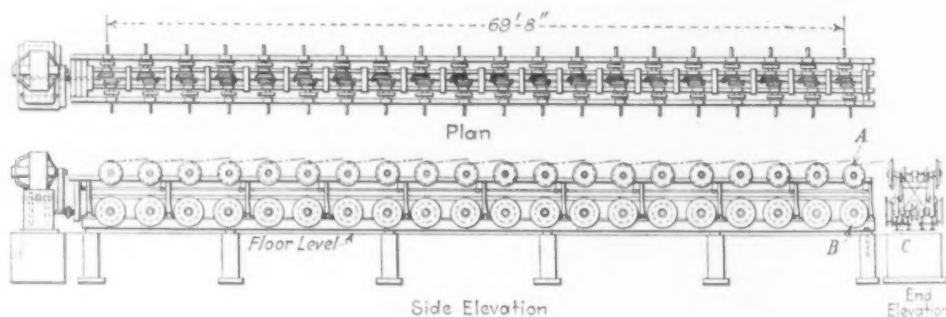


Fig. 4. With 40 Drums and Blocks, the Capacity of the Machine Is Greater Than with the Usual 32 or 36 Units. The motor drives from one end, by means of a through shaft from which bevel gears operate the individual units



stated that the changing over of the equipment from one kind of wire to the other takes only three or four hours.

### Taxation and National Income

In a pamphlet of 96 pages the National Industrial Conference Board, New York, reviews the subject of Federal, State and local taxation over the period of 1903 to 1921 and relates the amount of taxation to estimated national income. Attention is directed to the great extension of governmental activities in all countries during the past two decades, which has resulted in heavy increase in expenditures by the Government and hence in taxation. The per capita cost of government in the United States, \$22 in 1903, became \$45 in 1920-21, the increase being more than 100 per cent. Figures for other countries are shown in the table.

Per Capita Cost of Government			
	1903	1913	1920-21
United States	\$22	\$35	\$45
Great Britain	40	42	61
France	24	33	77
Italy	14	22	26
Germany	44	69	56
Japan	5	8	7
Average	26	37	45

The national income of the United States is estimated at 2½ billions of dollars in 1903, at 34½ billions in 1913; at 66 billions in 1919 and at 50 billions in 1921. The percentage of income taken by taxation is

given as 5.2 in 1903, increasing to 6.4 in 1913 and to 14.32 in 1920-21. These percentages are lower for the most part than for the other countries listed, Japan showing the highest rate previous to 1917 and giving place to Great Britain in the later years. In dollars of taxation per capita, however, the United States stands second only to Great Britain at all three of the periods covered in the table, with Japan lowest of all at all times. The per capita taxation for all purposes in the United States was increased from \$17.55 in 1903 to \$22.95 in 1913, to \$84.37 in 1920, thence falling to \$79.15 in 1921. The latter compares with \$124.84 in Great Britain at par of exchange, but with a considerable smaller quantity at current rates of exchange.

Industrial States, New York, Massachusetts and Michigan, in 1919 paid from 15 to 17.2 per cent of total income into the tax collectors' offices. This compares with agricultural States such as Texas, Georgia and Iowa, where the payments were from 7.6 to 8.9 per cent of total income.

The Wisconsin Foundrymen's Association held the first of a series of open meetings for all foundrymen at the Hotel Pfister on Nov. 28. H. P. Kreulen, Bethlehem Steel Co., was the principal speaker. A general discussion on the association and foundry work followed. Mr. Goldstein, of the Nash Motors Co., Kenosha, commented on some results obtained. The next regular meeting of the association will be held on Tuesday, Dec. 19, for members only.



# What to Expect from Foremen Training

## Results Obtained in Iron and Steel and Metalworking Plants, Particularly in Better Team Work and Closer Co-operation With Management

BY B. M. NUSSBAUM\*

**A**N executive of a large rolling mill in Illinois stated at a public meeting that production in his plant increased 34 per cent within the year. The increase he attributed largely to the improved foremanship resulting from a training course through which the sixty-two foremen had been conducted.

The industrial engineer of a New York shipbuilding works reported a 50 per cent reduction in labor turnover in the year following a course in foremen training. The more harmonious handling of the human element in the organization reflected in these figures was due, he said, to the training.

The president of another large industry reports that his company realized at least \$100,000 last year through improvements and economies suggested by members of the plant organization. And he credits foremen training with being the most important factor in bringing about this result.

### Management's Three Main Objectives

These are three great objectives toward which modern industrial management in the iron and steel and machinery industries is bending thought and effort: (1) To increase production, (2) to harmonize labor relations within the organization, and (3) to save money through improved methods and equipment and through added economies. Can foremen training give a plant these results? Is the management of a mill, foundry, or machine shop which adopts a program of foremen training justified in expecting increased output, reduced labor turnover and lowered costs? These questions put foremen training on a baldly practical basis, but surely there is no other basis on which it can claim the attention of industry. Executives are perfectly justified in asking these questions, and in judging foremen training by the answers it gives to them.

### Some "Musts" in Foremen Training

My reply to the above questions would be a yes with reservations. That is to say, foremen training will contribute toward these results provided certain conditions are met. The training must be adapted to the needs and limitations of the foremen. It must be presented to them in a way to win their interest and secure their study. It must be indorsed and supported in every way by the management (and the best results have been accomplished where the executives of the plant enrolled in the course and took part in the training with the foremen). And it must be accompanied by equally enlightened policies with reference to labor administration, industrial relations, production methods, and all other factors making for efficiency of operation.

This may seem a formidable program of conditions, but the fact is that most plants interested in foremen training are either already practicing or are favorably inclined toward the other enlightened policies suggested. In fact, these other policies become really effective only through enlightened foremanship. No matter how friendly and harmonious labor and management relations may be, a hard-headed orders-is-orders type of foreman can destroy it in a week of overbearing bossiness. And no matter what admirable production plans the management may lay out, and what efficient short cuts it may ordain, all of these improvements will stop short with the foremen unless they are in intelligent co-operation with the management.

Foremanship is therefore vital in all efforts to increase production, cut down labor wastes, and eliminate production losses of every kind. Even in those in-

stances where it has nothing to do with originating the efficiency efforts, it has it in its power to nip the effort and render it powerless. The three instances cited at the beginning of this article are typical of experiences in many plants where training has been used to improve the foremanship. In other cases managers have reported improvement in team work, in labor harmony, in the alertness and resourcefulness of the foremen, in relations between foremen and the management, without being able to cite tangible records of bettered production. But the fact that a result is intangible is no reflection on its value. Good will is an intangible, and yet it is one of the most valuable assets on the balance sheet of the average American corporation. Industrial good will is no less essential to successful operation than customer good will.

Perhaps the best way to enumerate results that may be expected from foremen training will be to quote some records, cite a few experiences, and give the testimony of some executives and foremen.

### Records of Foremen Study

Records of study are valuable only as an index of the extent to which the training program has got across to its foremen students. One of the stock objections to foremen training is that the foremen will not study. Many managers have said frankly to me that they were entirely "sold" on the desirability of a foremen training program, but that no training could be of much value unless it required some systematic study, and that foremen simply would not study. Well, here are the records of a few plants in the iron and steel and machinery industries with a foremen training program that does require study. The program here called for the study of text material, attendance upon lectures and conferences based on the text material, and the solving of plant problems in which the principles and methods taught in the texts were applied.

	No. of Men Who Enrolled	No. of Men Who Finished	Percentage of Men Who Finished
The Carborundum Co., Niagara Falls, N. Y.	98	75	75
Bucyrus Co., Evansville, Ind.	111	98	88
South Milwaukee, Wis.			
Cambria Steel Co., Cambria, Pa.	61	56	92
Carpenter Steel Co., Reading, Pa.	69	63	91
Detroit Steel Castings Co., Detroit, Mich.	28	25	90
Deere & Mansur, Moline, Ill.	44	44	100
American Steel Foundries, Indiana Harbor, Ind.	55	52	94
Niles - Bement - Pond Co., Plainfield, N. J.	86	71	82
Taylor-Wharton Iron & Steel Co., High Bridge, N. J.	50	46	92

Many more companies might be cited, but these are enough to give some idea of the results accomplished. Any training effort which will enlist so large a percentage of the foremen in active study means a great deal in changed attitude and changed habits of the foremen. It means their minds are more receptive to new ideas, accustomed to applying principles to industrial problems, and habituated to the idea of growth and increase in knowledge. "Just to get one of our foremen out of a know-it-all attitude and to get him to look on suggested methods and changes without his old attitude of prejudicial criticism is worth a great deal to the increased efficiency of our organization," said the superintendent of a Pennsylvania forge shop.

### Handling a Difficult Labor Situation

Perhaps where foremen training accomplishes its most noticeable results is in the realm of human re-

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lations within the department and within the plant. It is just here that the average foreman is most lacking. The driver type of foreman is less typical now than he was a generation ago, but in the ordinary department the foreman is still far from capable in handling his men, winning their loyalty, and ironing out the misunderstandings and grievances that crop up from time to time. He may not be a tyrant, but all too often he is a bungler in dealing with the delicate relations that exist between employer and employee, between management and men. For this reason no foremen training course can succeed completely unless it gives a good share of its attention to the problems of handling men. Indeed it is here, rather than in the technical processes and equipment of his department, that the average foreman most sorely needs systematic training.

I recall an experience in a New Jersey plant. A group of laborers had made a number of impossible demands upon the management and had threatened to strike unless the demands were met. This occurred two years ago, when labor was short, and a strike at that time would have been seriously embarrassing. At the same time, it would have been suicidal to grant the demands. It happened that just at this time the foremen and other department heads were in the midst of a three-months course of training in foremanship, and when the training class heard of the trouble the management was having with the threatening strike, they asked if they might not meet with the strikers' committee and see if the misunderstanding could not be ironed out. The management granted the request, a committee of the laborers met with a committee of the foremen's class, and they went into conference.

As a result of their study in the course the foremen had a more intelligent comprehension of the point of view and problems of the management, and were able to convey this to the laborers in a way that soon won their confidence. At the same time, the foremen, because of their closer contact with the laborers, were able to interpret the point of view of the men to the management in a way that the laborers themselves had been unable to do. The result was that the trouble was sifted down to a few fundamentals; these were adjusted to the satisfaction of both sides, and the strike was averted. It is not difficult to imagine how foremen thus trained in the art of managing men would be able to cut out misunderstandings and labor wastes in their own departments and key their men up to full co-operation with the plans and policies of the management.

### Two Important Results

Perhaps the effect of foremen training on the individual foremen can be summarized under two heads: 1. Training awakens the foremen mentally and gives them a valuable fund of new information on industrial principles where they have been accustomed largely to rule of thumb. 2. It motivates them for bigger work, makes them see the importance of their duties as a part of the whole team work of industry, gives them renewed self-confidence and usually a larger sense of loyalty to the plant and to the management of which they now feel themselves to be a part. These changes show up in keener thinking on the job, better handling of men, more skilful planning of work, improved relations between the department heads, closer co-operation with the management.

For example, the Warner Gear Co., of Muncie, Ind., enrolled 100 of its supervisory force in a course in production methods. "Immediately after we had started the training," said A. B. Bolender, general foreman, "I noticed a more hearty co-operation among the different department foremen. They were trying to help each other out of their difficulties to a much greater extent than I have ever seen a bunch of foremen in a shop of this size. They also seem much more congenial to deal with. I can also see a great difference in the way they handle their men. They go at it in a more tactful manner, and seem more interested in the welfare of their workmen. Most of the foremen are now doing more studying of conditions in their department, and are also starting a system

of planning their work, which is all the outcome of the training."

### Ability to Do Team Work

From a New London, Conn., plant comes this incident: "A while ago we had to move some heavy machinery. We had put it off as long as we could, as our knowledge in that line of work was limited, and finally when we started to tackle it, we couldn't seem to get anywhere. There were twelve men on the job, and six of them were in the foremen training course. Each man had his own idea. Finally one of the foremen said, 'See here, we're studying team work in the course; let's apply a little of that principle to this job.' We sat down, discussed the problem, agreed to a plan, and went to work. When we quit that night the job was done and everything was moved to the second floor. Our first try-out of team work was a real success."

"There is no question that the morale of our key men has been bolstered up and a feeling of unity maintained throughout the entire organization," said R. F. Bradley, director of personnel, in reporting results of foremen training in the American Tube & Stamping Co. of Bridgeport, Conn.

From the Detroit Steel Casting Co. this statement was made by E. E. Mains, metallurgist, who took the course with the foremen: "The entire organization has a much clearer idea of the function of foremen, hiring and handling men and materials, keeping of records, their relation to each other and to the management, which is already manifested in their work and attitude, and will result in greater co-operation and efficiency."

From observation and experience and the testimony of those who have benefited it may be said that foremen training can accomplish these direct results in the foremen:

- Better handling of labor.
- More receptive attitude toward new methods and improvements.
- Greater alertness and resourcefulness in originating improvements.
- Closer team work between departments.
- More intelligent co-operation with the management.
- Closer attention to wastes.
- Greater loyalty to the plant and pride in its workmanship.

These results a plant manager may confidently expect, provided the course is a practical one, dealing with fundamental principles and methods, and provided further that it is rightly conducted. Such a course, in my experience, must include text material, group discussion, lectures by men who know what as well as how, and problems calling for written work. From a real program of training real results may be counted on, which will be reflected in the cost sheet and the profit and loss statement.

### Decreased Operations in Valleys

YOUNGSTOWN, Dec. 12.—Independent iron and steel plant operations in the Mahoning Valley show a further recession this week, due to a seasonal condition at this time of the year. Of 109 independent sheet mills in the Valley, 85 were scheduled at the beginning of the week, or 11 less than last week. Independent open hearth capacity is melting at 70 per cent, 39 of 51 units being charged.

Owing to a slackening in business, the Brier Hill Steel Co. has cut its operations to 60 per cent, maintaining two blast furnaces, seven open-hearth furnaces and 19 sheet mills on the active list. Its plate mills are operating irregularly.

The Youngstown Sheet & Tube Co. is averaging 85 per cent and the Republic Iron & Steel Co. 75 per cent. In the Valley, independent schedules average 75 per cent, while subsidiary properties of the Steel Corporation are maintaining a 90 per cent level.

Car building and repair interests and tank plants are maintaining a high average production rate, owing to the sustained volume of business of such nature which is developing.



## WILL MAKE DURALOY

### New Product to Be Manufactured by the Cutler Steel Co.—Properties Described

The Cutler Steel Co., with a plant at New Cumberland, W. Va., and general sales offices, at present located in the Hudson Terminal Building, New York, will begin commercial production soon after Jan. 1 of duraloy, an oxidation, corrosion and abrasion-resisting metal. This product, a chromium iron alloy, is the result of approximately 12 years of extensive research and experimentation. Developed primarily as a low cost alloy oxidation resistant, it was found also to possess satisfactory resistance to corrosion under certain conditions; high tensile strength at elevated temperatures and hardness and toughness offering marked resistance to wear and abrasion.

The physical properties of the material vary according to specific analysis, treatment and whether cast, forged or rolled. The range is from properties somewhat better than cast iron up to those of commercial alloy steels. Physical properties, which show a wide variation, due to the difference in composition and treatment, follow:

Specific gravity, 7.60. Weight per cu. in., 0.27 lb. Weight per cu. ft., 467.00 lb. Coefficient of expansion per deg. Fahr., 0.0000090 (average). Contraction allowance in casting,  $\frac{1}{4}$  in. per ft. Brinell hardness, 170 to 600.

	Cast	Rolled or Forged
Ultimate tensile strength....	40,000-90,000	80,000-130,000
Elastic limit, lb. per sq. in....	30,000-80,000	65,000-110,000
Elongation in 2 in.....	2.0-0.0 per cent	26-8 per cent
Reduction in area.....	3.0-0.0 per cent	50-10 per cent

Careful tests have been made to determine the tensile strength at high temperatures and have disclosed the retention of a relatively large percentage of the original tensile strength. Typical results of such tests show 98,110 lb. per sq. in. at 392 deg. Fahr.; 72,000 lb. at 1112 deg.; 40,000 lb. at 1292 deg.; 25,000 lb. at 1472 deg.; 20,000 lb. at 1652 deg. and 10,000 lb. at 1832 deg.

The metal will satisfactorily resist oxidation up to 2100 deg. Fahr. Laboratory and industrial service tests conducted for extended periods at that temperature show practically no loss of weight. Above that temperature the results are uncertain, depending somewhat on service conditions, but it is claimed they are as satisfactory as can be obtained from any other metal. The following table gives results obtained from tests run at 1800 deg. Fahr., a fair average temperature for most applications, the figures in each case being the percentage of original weight lost.

Material	Hours					
	2	5	25	100	200	300
Duraloy .....	0.00	0.00	0.00	0.00	0.00	0.01
Nickel .....	0.01	0.14	0.50	0.80	6.80	(a)
Nickel-copper .....	3.81	12.10	(a)			
Cast steel .....	5.39	12.50	(a)			
Cast iron .....	5.57	(a)				
Steel .....	6.80	(a)				

(a) Material no longer considered because of excessive weight loss.

The metal is to be furnished commercially in practically every form, including castings, rolled or forged bars, sheet wire and tubing. Some of the uses to which the metal can be put on account of its long service life under heat, and consequent low heat hour cost are:

Heating furnace bottom plates, chain links, frames, guide channels, manifolds, saddles, sills, rollers, stack dampers; roasting furnace rabble arms, rotating sweeps, shafts, sleeves; enameling furnace T bars, burning points and racks; annealing boxes, carbonizing boxes, lead pots, oxidizing salt pots, hooks, baskets, pyrometer protection tubes; retorts for cyanide compounds, nitrogen compounds, oil cracking and low temperature distillation of oil shale, coal and special charcoals; annealing pans for non-ferrous work; molds for antimony, brass, tin, copper, type metal, zinc; burner parts and bosses; heat exchangers, tunnel and kiln linings, commercial gas plant muffles and benches, glass and vulcanizing molds, economizer and superheater tubing, soot blowers, valves for internal combustion engines, smoke jacks.

The chemical resistivity of the metal recommends it

for these uses: Chemical plants; autoclaves, digesters, containers, vats and piping, cylinder linings; linings for apparatus for treatment of oil refining residues; linings for caustic pots, salt pots and fruit juice and organic acid containers; impeller blades, rings, sleeves and all rotating parts; perforated and wire screens, ship parts and fittings; periscopes, valves, mining machinery.

Applications where resistance to wear and abrasion is essential suggest these uses: Balls and races for grinding; extrusion and drawing dies; liners for laundries in concentrators; liners for ore, coal and coke chutes; pan mill plates and mullers; metal tubing piercing tips, rolls.

### Last-Head-in-Boiler Riveter

A large riveting machine as shown in the accompanying illustration, for use in driving up the last heads in boilers through the manhole has been built recently by the Hanna Engineering Works, 1765 Elston Avenue, Chicago.

The reach of the unit is 14 to 18 in., the gap 35 in., the cylinder diameter 18 in., and the capacity 100 tons. The die stroke is  $5\frac{1}{4}$  in. The weight is 9900 lb. The machine is arranged for portable use in two positions and suspension is made with the dies vertical as shown.



Riveting Machine for Driving Up Through the Manhole the Last Heads in Boilers. It is arranged for portable use in two positions; suspension is made with dies vertical as shown. The reach is 14 to 18 in., the gap 35 in. and the capacity 100 tons

It swivels about a point close to the center of gravity, permitting the stationary die to be swung on and off the manufactured head of the rivet in a direction very nearly that of the line of die travel. The mass or weight of the riveter is not lifted or lowered in riveting.

The stake is of forged alloy steel. The distance from the center of the beam stake to end face of the die standing thereon is 30 in., which accommodates a 60-in. shell. The length of this die can be varied in conjunction with the opposite die to take care of shells as small as 42 in. in diameter. The distance from the axis of the dies to the long face of the throat is 16 in. This machine is used on high pressure containers in which the rivets are  $1\frac{1}{4}$  in. and the plates  $1\frac{1}{2}$  in. thick.

Either a straight push hydraulic actuating mechanism or the company's pneumatic mechanism may be provided for the machine.

## EXPORTS OF MACHINERY

### Openings for United States Manufacturers in Latin America and Other Lands

"Germany is experiencing a shortage of raw materials and fuel, which is handicapping her industrial progress," said Alan G. Goldsmith, chief of the Western European Division, Bureau of Foreign and Domestic Commerce, before the Cleveland foreign trade convention, held Dec. 5 under the auspices of the Cleveland Chamber of Commerce. In iron and steel production it is estimated, said Mr. Goldsmith, that Germany is running between 65 and 75 per cent of capacity.

Dr. Julius Klein, chief of the Bureau of Foreign and Domestic Commerce, pointed to the fact that Latin America is the third largest market of the United States for tin plate, taking in all about 15 per cent of our export of this product. About 12 per cent of the steel sheets shipped abroad go to Latin America, while approximately 48 per cent of the total exports of bolts, nuts, rivets and washers and 30 per cent of the exports of galvanized sheets are taken by Latin American countries. In barbed and other wire, Latin America has easily been our best export customer.

#### Demoralization in Europe

W. H. Rastall, chief of the machinery division, Bureau of Foreign and Domestic Commerce, discussed the export machinery situation as follows:

"Conditions have demoralized business in Europe. In 1915 Europe took more than half of the total of our machinery exports. Most of our manufacturers still seem to feel that their attention should be concentrated in that direction. We in Washington feel that other markets show prospects of greater expansion, more especially the markets of Latin America, Australia and Asia. In 1915 Asia took less than 6 per cent of our total machinery exports; in 1921, 26 per cent. In 1915 Asia approximated \$77,000,000; in 1921, \$246,000,000. Latin America in 1915 absorbed about \$12,000,000 worth of our machinery; in 1921 more than \$92,000,000 worth. Australasia increased her purchases from about \$3,000,000 in 1915 to more than \$7,500,000 in 1921. It would appear that the alert sales manager should place his greatest energies behind those markets that are expanding. Conditions in Latin America, Australasia and Asia are more or less similar.

## GREAT RAILROAD ACTIVITY

### Unprecedented Loadings of Revenue Freight—Coke Shipments Gain

WASHINGTON, Dec. 12.—Unprecedented loadings of revenue freight for this time of the year continue, total loading for the week which ended on Nov. 25, amounting to 955,495 cars, according to reports received from the rail carriers by the Car Service Division of the American Railway Association. This was an increase of 282,030 cars over the corresponding week last year and an increase of 151,794 cars compared with the corresponding week in 1920. The total for the week of Nov. 25, however, was a decrease of 13,599 cars compared with the preceding week. This decrease was almost entirely due to a seasonal falling off in ore shipments resulting from the cessation of navigation on the Great Lakes.

Coke loadings totaled 13,234 cars, a gain over the week before of 803 cars. Compared with last year, this was an increase of 6878, but a decrease of 1211 compared with two years ago. Ore loadings amounted to 15,052 cars, 17,728 below the preceding week. While this was an increase of 9334 cars above the same week last year, it was a decrease of 16,912 cars compared with the same week in 1920.

Locomotives in need of repair on Nov. 15 totaled 18,356 or 28.5 per cent of the number on line. This was a decrease of 10 locomotives compared with the number on Nov. 1.

Locomotives in need of heavy repairs totaled 15,120,

"The yen, the Philippine peso and the rupee are very close to their pre-war values. The Java guilder is somewhat depressed, while the Mexican dollar, the Shanghai tael and other silver currencies of the Far East are, as usual, practically the bullion value of their silver content. The Far East has recovered very largely from exchange troubles that developed during the war. Conditions in the Orient are much nearer normal than are those in Europe.

#### Japan Developing Rapidly

"We have recognized the rapid development in Japan. That country has been absorbing an amazing quantity of machinery. In 1911 China imported about \$200,000 worth; in 1920, \$14,000,000. In 1915 the Philippines absorbed less than \$1,000,000 worth; in 1920, \$10,000,000. In 1913 British India absorbed less than \$500,000 worth; in 1920, \$15,000,000. In four years Asia has absorbed over \$242,000,000 worth of American machinery, a larger quantity than would have been absorbed in 40 years at the pre-war rate.

"The American machinery salesman in Asia is a missionary of civilization of superlative potency. I warn you to watch Asia and the forces released by the mechanical missionary. From Yokohama to Bombay, Asia wants to be industrialized. These people realize that machinery will raise the standard of living for all. The foreign sales manager should give a great deal of attention to Asia.

"Another new development in the machinery trade lies in the fact that our competitors are disabled. Germany is no longer a factor of outstanding importance. Great Britain finds it difficult to sell machinery abroad.

#### Importance of Exports

"Export business is rapidly becoming of pressing importance. The Baldwin Locomotive works recently announced that 60 per cent of their product was exported. I know of companies that export well over 25 per cent. The latest figures available show that on the average the 4000 machinery manufacturing plants of this country export 17 per cent of their product. This business is absolutely necessary to the welfare of these shops, and to at least a million of our people.

"Good methods can multiply our machinery exports many times. The department of commerce is prepared to assist you to get this business on terms that include prompt payment and a clean contract."

an increase within 15 days of 19, while those in need of light repairs amounted to 3236, which was a decrease of 29 within the same period.

From Nov. 1 to Nov. 15, the railroads turned out of their shops 12,139 locomotives. The number of serviceable locomotives on American railroads totaled 46,101 compared with 46,096 on Nov. 1.

### Employment Gains in Iron and Steel Industries

WASHINGTON, Dec. 12.—The iron and steel industry made the greatest gain in employment in November of all industries, having added 12,735 during the month. Expansion of employment throughout the nation was the greatest in November since Jan. 1 last, according to the report of the United States Employment Service, 1428 concerns on Nov. 30 having 44,653 more employees on their payrolls than those carried on Oct. 1. The improvement in iron and steel was reflected in metal and metal products other than iron and steel with an employment increase of 3294.

The approach of winter has caused a decline in building operations in many parts of the country without causing a surplus of workers in these lines. In some cities, however, building programs are unabated and increasing in volume. With the advantage of open weather, highway construction and public improvements are continuing to absorb large numbers of unskilled workmen. The common labor shortage has been relieved in a measure by the release of many farm workers but it is still apparent in many places.



# Movement to Designate Steel by Numbers

## Investigation Instituted Under Government Auspices by Engineering Standards Committee to Have Numbering System for Tool and Other Steels

WASHINGTON, Dec. 12.—Based upon a system of definite specifications to be worked out by a sectional committee of the American Engineering Standards Committee, a recommendation was adopted here last Wednesday at a meeting in the Department of Commerce building to make an investigation looking to the uniform numbering of forging, casting, structural, tool and other steels. Vigorous opposition was expressed by makers of tool steel to the inclusion of this class of material in the investigation, but the resolution was carried by a vote of 18 to 3 with 7 not voting.

The conference was called by the American Engineering Standards Committee at the request of the United States Bureau of Standards and was attended by approximately 30 steel producers, consumers, representatives of technical societies and Government officials, including Dr. G. K. Burgess, head of the metallurgical division of the Bureau of Standards and chairman of the metal committee of the Federal Board of Specifications, who presided over the conference.

The sectional committee to be appointed will be sponsored by the Society of Automotive Engineers and the American Society for Testing Materials, whose numbering systems were declared to have proved satisfactory. The committee will be made up of representatives of all the interested parties, including producers and consumers. The recommendation in favor of the investigation at first excluded tool steel after protest had been voiced by J. H. Parker, of the Carpenter Steel Co., Reading, Pa., and who, as a representative of the tool steel industry, read a statement from Dr. J. A. Mathews, president of the Crucible Steel Co. of America, who declared that numbering of tool steel was impracticable. His attitude was similar to that of other makers of tool steel. Subsequently, however, the resolution was broadened so as to embrace tool steel.

### French System in Favor

Another interesting feature of the meeting was the reading by L. H. Fry of a report on European practice regarding the numbering of steel in which it was declared that only the French and Swiss systems could be offered as bases for use in the United States. General comment on the report indicated that the conference favored the French system providing for definite grades by complete specifications, and avoiding a code system. Several objections were raised to the Swiss code system. Other countries covered in the report have made no or comparatively little progress regarding the practice.

In adopting the resolution favoring the numbering of steels, it was the sense of the conference that the system should be based upon definite specifications rather than being based upon suggestions relating to chemical and physical properties and heat treatment. Also it was felt that the sectional committee should be given freedom of action and not be bound to a rigid plan. The point was made that the specifications be standardized before adopting a numbering system.

### Some Objections to a Numbering System

In opposing any numbering system for tool steel, Mr. Parker quoted from Dr. Mathews' memorandum which declared that tool steel has many components and that the steel from one heat alone may vary in analysis, to say nothing of the differences between various heats, and that a numbering system would be impracticable. It was asserted it would be a retrograde move and that such a system would be extremely complicated.

R. M. Bird, of the Bethlehem Steel Co., who represented the American Society for Steel Treating, said that the success of the Society of Automotive Engineers was due to its system being based entirely on chemical

composition. He said that the numbering system is not and cannot be a specification and added that conflict with the systems of steel makers would be the inevitable result. The Bethlehem Steel Co., he said, has its own system for numbering grades and kinds of steel, which is an extension of the S. A. E. system, but it was declared that it cannot apply to tool steel.

C. F. W. Rys, Carnegie Steel Co., said he did not think it would be possible to develop a symbol or number system or a combination of the two until sets of definite specifications had been worked out, such as those of the A. S. T. M. and the S. A. E. F. P. Gilligan, Hartford, Conn., representing the S. A. E., said that the S. A. E. first decided on the compositions needed by automotive makers and then designated numbers and that it is satisfied with the numbering system, which has not reached its limitations. He said the society is ready to co-operate for the extension of the system but that it had been disturbed through outside units distorting the numbers and he declared that if there is an extension of steel grades to fit all numbers the S. A. E. will find itself without a numbering system.

### Federal Board of Specifications

Army and navy representatives went on record in favor of a numbering system for all steels and said that they have systems of their own, but that extension of the system is desirable provided it does not block progress and destroy initiative in perfecting steel grades. They said that objections raised to-day regarding numbering of tool steel are like those the Navy and War departments faced 25 years ago regarding specifications but had to overcome, the result of which, it was declared, was to build up and perfect the steel industry.

Dr. Burgess pointed out that the Federal Board of Specifications soon will work out a system calling for but one specification for one metal. The matter of inspection will be left to the purchaser, he said. The board is attached to the Bureau of the Budget and is adopting specifications for materials and supplies purchased by all Government departments and when adopted it will be mandatory for all departments to follow them in preparing their own specifications for materials. The board is made up of experts from the various bureaus, and the Bureau of Standards gives advice and conducts necessary tests in its extensive laboratories. In all cases, it is pointed out, specifications are selected after thorough consideration of the Government's needs on the one hand and the manufacturers' interests on the other. It is intended that these specifications shall provide for goods that satisfactorily fill their purpose, but will at the same time be such as can be economically manufactured. They are declared to provide for the best commercial practice and not to put the Government in the position of demanding specially made material.

Speaking on behalf of consumers, Mr. Lynch said there is considerable confusion experienced in ordering steel that is wanted in a hurry and that it is felt by the users that if producers could get together, it would be found that but little would have to be added to the S. A. E. specifications. The S. A. E. system was commended by George L. Norris, New York, also representing that society, who favored the extension of its system to steels which it does not now cover. Like others he opposed using the brand name with the numbering system and said such a practice would run counter to the by-laws of the S. A. E. and the A. S. T. M.

### Part of Plan to Eliminate Industrial Wastes

The conference was held in connection with the activities of the Division of Simplified Practice of the De-

partment. It was intended that the conference should be addressed by W. A. Durgin, head of the division, but he was absent from the city, as was also Secretary Hoover, who has shown extreme interest in this division, because of its underlying purpose to eliminate waste.

Dr. Julius Klein, director of the Bureau of Foreign and Domestic Commerce, was scheduled to make the opening address at the conference and to welcome those present, but owing to his presence before a committee of Congress, was unable to appear. It would also have been the purpose of Dr. Klein to express the attitude of the department regarding such conferences as that on the numbering of steels. It is known that the department does not consider itself as an expert in such matters but recognizes as experts only those in the steel industry. It is the official attitude of the department that the men in the industry with their knowledge gained through years of study, research and practical experience, will determine whether or not the numbering of steels will serve to eliminate many of the wastes arising out of the modern tendency to provide an infinite variety of ways or means of serving a common purpose. It is felt by the department that the analysis of the utility requirements of the various fields may show that several purposes may be efficiently served by a reduced variety of steels—in which case the resultant interchangeability cannot help but react to the advantage of the producing industry and to the consumer as well.

Recognizing that some centralization of the best thought and practice of the industry is needed, the American Engineering Standards Committee was selected to work toward that end. It is the attitude of the department that if the codification of steels, and consequent specific designation by number or otherwise, means a further conservation of national resources and a reduction of the present extravagance with which the most precious resource, human energy, is conserved, such action will be highly significant. The department

is working toward what has been described by the statement that the highest aim of the people can well be to make the processes of trade, industry and commerce as direct and simple as possible in order that the consumer may be supplied more readily with the necessities and comforts of life.

#### Colorado River Development Project Emphasized

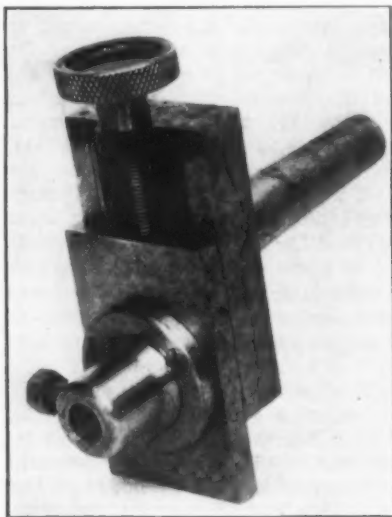
The trip of Secretary Hoover in the West and his accomplishment is held by the department to be of extreme importance to the iron and steel industry. Through the recent efforts of Mr. Hoover, the compact for the development of the Colorado River basin has been signed by the seven States affected. In the opinion of officials of the Department of Commerce, this means a vast region will be opened for agricultural activities, bringing with them greater demand for farm machinery of all kinds. Dr. Klein is of the opinion that the great power reserve created will mean tremendous industrial activity and increased business for steel producers and manufacturers of machinery. Pointing out that railroad facilities will be extended into these hitherto unpopulated regions, Dr. Klein has explained that the Great American desert will give way to onward march of American ingenuity, resourcefulness and enterprise.

"In every step of this huge undertaking steel will play an important part," according to Dr. Klein. "In fact, there is no greater prospective market ahead for the American steel industry than that connected with this project. This new market, added to those existing for steel, and the products made therefrom, means the industry will be taxed to its utmost capacity to meet the demand. Without question, then, it is absolutely necessary that the industry put its own house in order by eliminating all avoidable forms of waste to the greatest possible extent. The elimination of excessive variety and duplication in manufactured products commonly used is one important step; the further development and application of standards is vital."

#### Precision Eccentric Boring Head

The Bruce precision eccentric boring head shown in the accompanying illustration is being placed on the market by the Precision & Thread Grinder Mfg. Co., Philadelphia.

The tool is intended especially for application to drill presses and milling machines for boring jigs and fixtures and also for index boring. It is graduated in



Eccentric Boring Head for Application to Drilling and Milling Machines When Boring Jigs and Fixtures, and Also When Index Boring. The eccentricity of the tool is varied by means of the micrometer screw shown

0.001 in. and provided with a gib to take up wear. Adaptors are provided, these being designed to take various sizes of drills within the capacity of the tool, which permits drilling and boring.

Four sizes are available, the No. 1 having a range of  $\frac{3}{8}$  to 1  $\frac{1}{2}$  in. and the No. 4, 1 to 6 in. The tool is furnished with a set of six boring tools, chuck and test indicator.

#### A Moving Picture of the Production of Cast Iron Pipe Centrifugally

At the National Exposition of Power and Mechanical Engineering at the Grand Central Palace, New York, last week, a moving picture film was exhibited of the DeLavaud process of making cast iron pipe centrifugally as practiced by the United States Cast Iron Pipe & Foundry Co. at Birmingham, Ala. The film included details of the old method of making pipe by the sand mold process, this constituting the first part of the film. The picture, as taken by the Patheoscope Co. of America, Inc., and exhibited in their rooms in the Aeolian Building presents in strong contrast the details of the old and new process carried on in the same plant. The picture shows the latest improvements in the DeLavaud process, which has been considerably modified since the first details of it were published by THE IRON AGE in 1916. The film was also shown before a meeting of foundrymen in Boston.

#### Labor Legislation Association Meeting

The annual meeting of the American Association for Labor Legislation is scheduled for Dec. 27, 28 and 29 at the Congress Hotel, Chicago. A session for Wednesday afternoon on "Industrial Wastes and General Welfare," is to be held at the City Club, of Chicago; a session on Thursday morning at the Congress Hotel will be devoted to the "Business Cycles and Unemployment"; a session on Thursday afternoon is to be devoted to "Factors to be Considered in Wage Determinations"; the Thursday evening session will take up "Workmen's Insurance," this held at the City Club; and on Friday morning a joint session will be held with the American Statistical Association on "Employment Statistics." Thomas L. Chadbourne, New York, is president and Dr. John B. Andrews, 131 East Twenty-third Street, New York, is secretary of the Association.



# Flue Dust Briquetting by Corrosion Process

Plant of M. A. Hanna Furnace Co., at Buffalo—  
Claims of the Economic and Practical  
Value of the Product

BY A. L. STILLMAN\*

THE corrosion process of briquetting applied to blast furnace flue dust has been adopted by the M. A. Hanna Furnace Co. for flue dust reclamation, and the company's first plant is now operating in Buffalo.

This plant, before the present process was installed, had an interesting history. The original installation was made by the Buffalo Slag Co. in 1919, following the lines of the well-known Schumacher catalytic process. Flue dust was mixed with a catalytic solution which gave it a certain cementing property, which was accentuated by fairly heavy pressure. Briquettes were formed in a Schumacher type of press—a toggle of

from the belt by hand and piled for 24 hr. seasoning.

The methods of flue dust preparation for recharging for the blast furnace are three:

- Sintering and nodulizing only,
- Briquetting only,
- Briquetting followed by sintering.

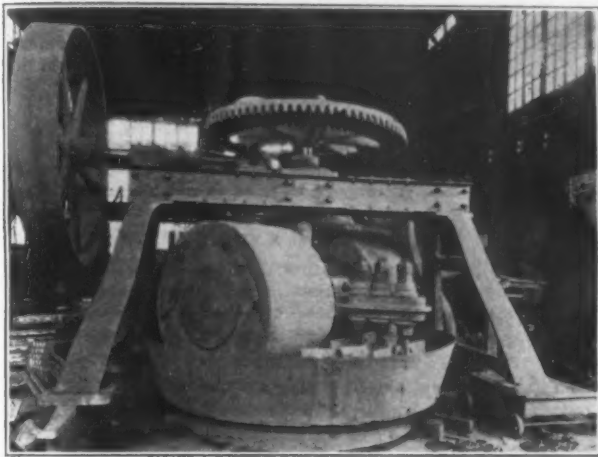
It has always been thought that by the second method—briquetting only—a better product would be obtained. Until quite recently the Schumacher or catalytic method has been the best system of briquetting evolved, both from the standpoint of cost and of product. None the less, its progress in the United States has not been rapid. With the exception of the plant at the Buffalo Slag Co. but one other installation was in operation in the United States in 1920. That was also in Buffalo, at the plant of the Wickwire Steel Co. The operation was practically the same, but the briquettes were cylindrical, 7 in. in diameter and about 4 in. high.

The criticism of the process in America, the reasons why it has not taken hold are as follows:

1. The briquettes are large and bulky.
2. The hand labor involved in moving briquettes and piling them up for storage is a distinct disadvantage.
3. The time required for setting; namely, 24 hrs. before the briquettes become strong enough for ordinary handling and charging into the blast furnace is also a disadvantage.

The majority of blast furnace men turned from briquettes to sinter reluctantly—reluctantly because they did not like to give up the advantages that briquetting gave them; namely, the low first cost of plant, the low cost per ton of production, the realization of coke value in the dust, the porosity and the easy reducibility. Again, briquetting was simple—required no fire box, no heating, no highly skilled labor, no technical supervision. Experiment has been continuous, therefore, to find a way to preserve the advantages of briquetting and do away with some, at least, of the disadvantages.

The first requirement is size. The briquettes must be made smaller. In making briquettes on piston presses the cost per ton varies inversely with the size. In making briquettes 7 in. in diameter on the Schu-



An 8-Ft. Pan Masticator Used in Preparing the Briquette Mix

mechanical type with a horizontal rotating mold table. The pressure realized in the Schumacher press was about 8000 lb. per sq. in. and the capacity was 8 tons per hr. The briquettes were brick shaped, and their dimensions were:  $5\frac{1}{4} \times 8\frac{3}{4} \times 3$  in. After formation in the press, the briquettes were carried on a conveyor belt to a storage bin where they were removed

\*General Briquetting Co., 25 Broad Street, New York.



Briquettes on Seasoning Belt on Way to Cars at Buffalo Furnaces. Briquettes of the old form are shown at the left

macher press briquetting costs were somewhat lower than sintering costs. Obviously, when this diameter was shortened, the cost mounted. It was necessary to abandon the piston type of press altogether.

The Belgian or roll type of press has been used in many places and for many years in the briquetting of coal fines. The usual Belgian press consists of two rolls operating against each other with pockets so placed as to form eggette or pillow shaped briquettes. The pulverized material mixed with its binder is fed to the machine from a feeding hopper in which fingers, mounted on rotating arms, perform the function of providing the rolls with a steady, balanced feed.

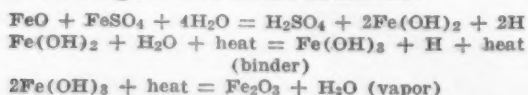
Pressures are difficult to estimate, but it is probable that such presses are usually operated so as to give the equivalent of 3000 lb. per sq. in. As the pressure is really a succession of linear pressure varying at each point on the briquette inversely with the thickness of the briquette at that point, the actual measurement is extremely difficult. The behavior of briquettes as usually made in such presses is about the same as those of piston and mold briquettes made at 3000 lb. per sq. in.

In flue dust briquetting these presses were tried and found wanting; the pressure was insufficient, the briquettes were weak—too weak, indeed, to stand the fall from the press—and nothing of merit was accomplished until the application of the Universal press to the problem solved the difficulty. The important discovery of the self-feeding roll made by Ellsworth B. A. Zwoyer and featured in this press, solved the pressure problem. Pressures equivalent to 6000 lb. per sq. in. were realized and small briquettes made at this pressure were able to stand the drop from the press. The press itself deserves a word of description.

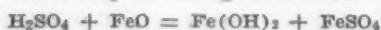
The Universal press is the result of a comprehensive study of all types of roll or tangential presses and extended experience in operating briquette plants. It consists of a frame, rolls, drive and feed. The side girders of the frame contain recesses for the bearings for the driving shaft and for the two intermediate shafts. Steel tie bars, surmounting each of these girders, serve to take up the thrust of the rolls through the bearings. The press is rugged and simple, having the fewest moving parts consistent with performance.

The feed consists of a vertical hopper, without mechanism or rotating fingers, mounted directly above a pair of briquetting rolls. In the vertical hopper a column of material is fed, and the size and weight of the column determine the actual weight upon the briquettes. The weight of the material presses down upon the mixture actually undergoing pressure. The pressure of the material thus thrown against the rolls produces a reaction, which is exerted by the rolls themselves as pressure upon the forming briquette. The rolls are made of special cast iron, cast in one piece, and fastened directly to the shaft without a spider. The diameter of the roll is proportional to the size of the briquette made. For a 2 in. square briquette, weighing 4 oz., 20-in. diameter rolls are used. The shape of briquette turned out by this press may be described as that shape formed by two equal size pyramids with square bases coincident, with apices and corners rounded off.

The corrosion process as adopted at Buffalo is simple in principle. The term corrosion is used because an acid or corroding agent acts upon the iron monoxide in the flue dust with corrosive effect, making iron sesquioxide. The usual corrosive agent is wire mill liquor or a solution of copperas. One part copperas crystals, 9 parts water, 45 parts fresh flue dust and 45 parts old flue dust is a typical briquetting mix. These ingredients are thoroughly mixed, masticated and pressed. A binder forming reaction occurs as follows:



As the heat moderates and the excess of water evaporates the ferrous sulphate is again formed.



It will be seen that the oxidation takes place through acid reacting upon the iron ore, and returning to its own constituency after the exhaustion and drying out

of the water present. The iron sesquioxide formed in this manner is a dense, hard, waterproof binder.

In the plant operation the dust is dumped from cars and screened. Screened dust goes to feed bins from which it is withdrawn by measuring tables. The tables discharge a measured quantity of the dust to a horizontal pug mill wherein is added the proper proportion of corrosive agent. The flow of the solution is regulated by valve. The pug mill discharges the mix into the pan of the masticator.

The masticator, as will be seen, consists of a pan—stationary—about 8 ft. in diameter, over which operate two heavy rolls—48 in. in diameter and 24 to 38 in. wide—alternated by distributing plows. The capacity of the machine is determined by the speed at which it is operated and by the positions in which the plows are set. Ordinarily, it is desirable to give at least four passes of the rolls to the material passing through. The mix is fed at the side and discharged through the center. The masticator is primarily a first class mixer wherein the diffusion of a liquid through solid particles takes place. Then, too, by mastication the breaking of the dust particles by the rolls, combined with this better diffusion of the solution, results in more rapid and efficient chemical reaction or binder formation. It has generally been found that briquettes made by mastication are stronger, better and quicker setting than those not so made. Again, where mastication is used a greater proportion of old flue dust, which, containing but little FeO, is inert and has no part in the chemical reaction, can be carried.

From the masticator the mix, now thoroughly digested, is conveyed to the press, above described. From the press the briquettes drop to a belt. They are soft when made—just strong enough to stand the drop from the press to the screen chute on to the traveling belt. On the belt they obtain one hour's slow travel in the open air. The briquettes, drying rapidly in the heat of the chemical reaction, form a high permanent set in that time. As the surface exposed in proportion to volume of briquette is four times that of the Schumacher variety, the time required for hardening and seasoning is very much less. At the end of one hour they can safely be dumped into the bins.

The photographs reproduced were obtained from the Chemical Publishing Co., Easton, Pa., which is publishing a book on "Briquetting."

The Precision Instrument Co., Inc., Detroit, has acquired control of the Precision Instrument Co. of Newark, N. J., draft gages, pressure recording instruments, CO<sub>2</sub> and specific gravity recorders, laboratory meters, etc. The present management remains unchanged. C. P. Baldwin, president, says the company expects to enlarge the business considerably, adding several new lines. The company's New York office will be in the Engineering Building, 114 Liberty Street. The factory will later be located in New York.

To teach heating and ventilating engineering by mail the Northern Institute, 1951 East Fifty-seventh Street, Cleveland, was incorporated Nov. 1, having acquired the Cleveland Engineering Institute. The present officers are: President, George W. Roberts; vice-president and general manager, K. L. Seelbach; secretary, Henry F. Pollock, formerly vice-president of the McCaskey Register Co.; treasurer, W. L. Seelbach, Walworth Run Foundry Co. Mr. Roberts remains as director as does Earl A. Davis as chief examiner.

During the first ten and one-half months of 1922, the Bessemer Limestone & Cement Co., Youngstown, shipped 1,000,000 bbl. of cement from its plant at Bessemer, Pa., which has an annual rated capacity of 1,000,000 bbl. The company is constructing additional storage facilities to enable it to build up larger reserve stocks against spring demands.

The H. B. Smith Co., Westfield, Mass., heating appliances, has granted a wage increase of 10 per cent to something more than 500 workers, effective Dec. 4. An increase of 15 per cent was asked by the workers.



## NOVEMBER STEEL OUTPUT

### Ingot Production Rate About 39,500,000 Tons Per Year—Increase Over October Very Small

According to the steel ingot statistics, as collected by the American Iron and Steel Institute, the 30 companies which in 1921 made 87.50 per cent of the total, had an output in November of 2,889,297 gross tons. This compares with 2,872,415 tons in October and is an increase of 16,882 tons. The increase in October over September was 498,636 tons.

On the assumption that companies reporting are supplying the same percentage of the total as they did last year, the output for the 26 working days of November was about 3,302,000 tons or 127,000 tons per day. The October production on the same basis was about 3,282,760 tons or approximately 126,260 tons per day. The November output was at the rate of about 39,500,000 tons per year.

The statistics of the American Iron and Steel Institute since January, 1921, follow in gross tons:

Monthly Production of Steel Ingots by 30 Companies Which Produced About 87.50 Per Cent of the Steel Ingot Production in 1921

Months	Open-Hearth	Bessemer	Other	Total
January, 1921	1,591,281	608,276	3,629	2,203,186
February	1,295,863	450,818	2,796	1,749,477
March	1,175,591	392,983	2,404	1,570,978
April	1,000,053	211,755	2,150	1,213,958
May	1,047,810	216,497	1,543	1,265,850
June	808,286	193,644	1,476	1,003,406
July	689,489	113,312	575	803,376
August	915,334	221,116	1,621	1,138,071
September	908,351	265,152	1,207	1,174,740
October	1,269,945	345,837	1,028	1,616,810
November	1,294,371	363,912	1,718	1,660,001
Total—11 months	11,996,404	3,383,302	20,147	15,399,853
December	1,129,174	296,380	1,539	1,427,093
Total—Whole yr.	13,125,578	3,679,682	21,686	16,826,946
January, 1922	1,260,809	331,851	822	1,593,482
February	1,395,835	348,571	616	1,745,022
March	1,918,570	451,386	795	2,370,751
April	1,997,465	445,939	1,109	2,444,513
May	2,214,774	494,893	1,474	2,711,141
June	2,143,708	487,851	2,918	2,634,477
July	2,020,572	464,047	2,485	2,487,104
August	1,807,310	404,379	2,893	2,214,582
September	1,911,147	460,127	2,505	2,373,779
October	2,352,207	518,010	2,198	2,872,415
November	2,360,903	525,945	2,449	2,889,297
Total—11 months	21,383,300	4,932,999	20,264	26,336,563

The November daily estimated output of 127,000 tons compares with 70,720 tons per day in January and with 114,700 tons per day in May.

### Cost Accounting in the Manufacture of Iron and Steel Sheets

The National Association of Cost Accountants has recently issued an official publication entitled "Cost Accounting in the Manufacture of Iron and Steel Sheets," by Keith B. Woods. While the article is necessarily condensed, the author has endeavored to make the pamphlet a comprehensive outline of a system for obtaining accurate costs. Among the many points brought out as resulting from the application of this system are the following:

1. There is practically no duplication of effort, the original entry following right through to the cost sheets without re-writing. An example of this is where the service card or order is used for the overhead on the cost sheets.
2. All cards are so laid out that the exact responsibility of each superintendent or foreman is shown.
3. The card of accounts is carried in the greatest detail but shown on most cost sheets in about nine items. Each one of the nine items can be quickly analyzed down to the last requisition or labor card, etc., in its original entry.
4. Probably the greatest improvement over the ordinary sheet cost system is that the costs are mathematically correct as to different products and gages. Sheets are sold by gage or gage differentials from a base gage and finish differentials from a fixed product—one pass cold rolled and box annealed steel sheet No. 28 gage. In the system outlined great care has been taken to get the distribution of expenses on the correct basis for each kind of expense of every department, both to other departments and to the product, and there is no averaging of gages either on the cost sheets or through

the inventory to confuse the real cost and give one on the cost of sales that for a given period is practically meaningless, although probably correct over a moderately long period.

Copies of this pamphlet may be procured from the office of the secretary of the association, 130 West Forty-second Street, New York. The price to non-members of the association is 75c. per copy.

### Valuable Ore Statistics

The Lake Superior Iron Ore Association through its secretary, W. L. Tinker, has just issued for distribution among the members a 25-page booklet containing tabulations of various data relating to the production and shipment of Lake Superior iron ore. Shipments from each mine for each year are given from the time the mines were opened, some of these records going back to 1854. Receipts at Lake Erie ports and the amount of ore on docks at the opening and close of the season are given as far back as 1883. Production of ore from mines outside the Lake Superior district and the imports of ore from 1879 are listed. The tables are reproduced on photographic paper, being photographs reduced to one-half the size of the original typewritten tables.

### Receiver's Fine Showing

Steps toward the liquidation of the Standard Parts Co., Cleveland, have been taken at a meeting held by Frank A. Scott, receiver and the creditors' committee. The company has been operating under a receivership since September, 1920, and during that time its liabilities have been reduced from \$11,000,000 to less than \$7,000,000, and the receiver has returned to creditors 30 per cent in liquidated dividends. At the request of the creditors' committee, the receiver will make application to the court to offer the plants for sale, either publicly or privately. At present the company is operating four plants, the Standard Welding Division, the Perfection Spring Division and the Eaton Axle Division, Cleveland, and a spring plant in Pontiac, Mich.

### Use of New Carnegie Dock

The recent placing by Carnegie Steel Co., of the contract for what is to be known as the Central Dock on the Monongahela river, near West Braddock, Pa., is not, as has been generally assumed, the first step in the direction of the use of the inland water ways by the Steel Corporation for long distance shipments of steel. It is reliably stated that the Corporation in building this dock has in view the greater use of the rivers in connection with interplant movement within the Pittsburgh district, and does not contemplate at this time making shipments of steel to down river points, as already developed by the Jones & Laughlin Steel Co., and planned by some of the other independent steel companies with locations on or adjacent to the rivers. The contract for the construction of the dock has been placed with the Dravo Contracting Co., Pittsburgh.

### Wages in Michigan Foundries

According to investigations of the Michigan Foundrymen's Association, the tonnage of melt increased in October over September, a betterment in activity regarded as due in part to the automobile industry.

Floor molders are now receiving between 55 and 65 cents an hour for a 9-hr. day and bench molders between 50 and 60 cents. Specific cases there are of higher wages, but the figures mentioned are believed to be a fair average. Male core workers earn around 50 cents. Wages for common labor have increased pretty generally from about 40 cents to 50 cents an hour.

The association will hold a meeting on Thursday, Jan. 18. J. Edgar Lee, Grand Haven, Mich., is president, and A. W. Blodgett, 419 Kelsy Building, Grand Rapids, is secretary.

## ALUMINUM IN STEEL

### An Argument Favoring Its More Liberal Use— How Not to Use It

BY W. H. KEEN\*

GENERALLY speaking, the open-hearth process is much the same to-day as it was yesterday, with the same methods of handling the reactions except for slight changes due to individuality of melters. Protests from metallographists against the use of aluminum have been so loud that the average open-hearth superintendent has eliminated it from his category except for use in occasional homeopathic doses. The object of this article is to call attention to the fact that aluminum should be one of his most important reagents and should be used freely at the proper time.

Why is it that protests are so numerous against use of aluminum in the killing of steel? The recent literature seems crowded with adverse criticism, with almost never a word of commendation. The use of aluminum results in decidedly more and greater advantages than disadvantages, and in fact the writer goes so far as to say that its use is exceedingly desirable, almost necessary to produce a perfectly clean, sound steel. It is true that photomicrographs have been published showing inclusions of alumina as the cause of failures and, while these data are important, and should be given due consideration, yet the accompanying information as to manufacturing details is all too meager to use the information in a scientific analysis of the problem.

It was regular practice in an open-hearth alloy steel plant, where the writer was at one time employed, to add a small amount of aluminum in the ladle and in the molds. It was used because no bad results had ever been traced to its use and because, on occasional heats which were inclined to be a little wild, it quieted the metal and saved the ingots.

In this connection, it is advisable to call attention to the very powerful effect of very small additions of aluminum; most melters are familiar with it but it is worth repeating. Ingots of soft steel particularly (0.10 to 0.15 per cent carbon) when not completely killed will throw a worm and sometimes actually boil in the mold, even after the initial set of the surface and several minutes after pouring. A few small pieces (less than an ounce to 1000 lb.) thrown in during the pouring will prevent this entirely.

#### How Additions Should Be Made

However, addition of aluminum to the individual ingots is probably open to severe criticism, and it is more than likely many samples of steel found to contain inclusions of aluminum oxide represented heats poured in this manner. Pieces of aluminum thrown into metal rising in an ingot mold oxidize not only from reaction with carbonic gas and oxide impurities in the steel, but also with oxygen from the air as the small pieces float about for an instant on the surface of the metal and then become entrapped.

Aluminum should be added in the furnace before tapping and should be immersed completely in the bath. In this manner all of the desired effect of the reaction is obtained and none of the undesirable results. Aluminum is also beneficial in electric steels, but smaller additions will accomplish the end desired.

The thermit reaction is utilized to-day in the preparation of many important metals and no objection has ever been made to use of these metals in steel because of their aluminum content. In this reaction, aluminum has shown itself to be a very powerful reducing agent and, in addition, to react so consistently that conditions are always under excellent control.

Oxides are the principal non-metallic impurity in steel—all steels, particularly open-hearth and Bessemer. The ordinary reduction with silicon and manganese in the natural way, is effective, but almost never perfect and varies according to the skill of the melter and other conditions due to the mixture used, tempera-

ture of the furnace and action of the slag. If aluminum will reduce such metals as tungsten and vanadium so perfectly, why shouldn't it be applied to steel? The writer has had experience with its use in steel and can state that it will "kill" the steel most effectively.

#### Other Advantages

It has other advantages incidental to its use when added to the bath. The analysis can be kept in much better control. In the case of the open-hearth, the addition of 2 to 4 lb. to the ton, according to condition of the bath, will stop the boiling reaction instantly and the bath will lie perfectly quiet as long as the aluminum is in excess. The carbon remains practically constant under these conditions, and any slag which may have been taken up by the metal has abundant opportunity to rise to the surface before the heat is tapped. Guesswork on re-carburizing is eliminated, as the laboratory test of the bath is of much greater value than under the usual conditions where the reaction is allowed to continue.

Experiments were made increasing the quantity of aluminum added up to an amount found by analysis of 0.37 per cent. The object was to determine any bad effect of the aluminum on the steel. Tensile tests showed a slight improvement with every increase in the amount used, and we judged from this that the additions were not harmful. Several lots of aluminum used were found to contain small percentages of zinc. When so contaminated, the results were poor. Zinc is often found in aluminum reclaimed from scrap and should be guarded against carefully.

No substitute for aluminum has yet been found, but recently a new alloy (calcium silicide) has appeared on the market with similar claims for its performance. This alloy has merit but, in its present state of development, has to be added to the ladle. It would be interesting to make a direct comparison with aluminum if it could in some way be introduced effectively into the bath.

Steel deoxidized by large doses of aluminum will be found very clean and dense and will work up with a minimum of chipping or grinding and mill losses. The improvement is particularly noticeable on nickel-chrome and chrome steels.

The writer realizes that the foregoing statements will probably meet with considerable adverse criticism from many sections of the country, but he considers the results important because they contradict a well-established prejudice.

#### More Regular Car Movement

YOUNGSTOWN, Dec. 12.—Though peak of the fall freight movement was passed about four weeks ago, carriers serving the Youngstown district still report a heavy loaded car traffic. Industrial freight traffic on certain roads is expected to establish a new record in December, from present indications. Open weather has thus far enabled railroads to handle the large volume of steel tonnage which has been offered them.

There is considerably more regularity in the car movement, and the supply of box car and mill type gondolas has shown substantial improvement this month. More than 7000 loaded cars are being moved daily on the Ohio Region of the Erie.

While ore shipping from boats has virtually ceased, the movement from lake docks to inland furnaces is still under way. Blast furnaces are operating at a comparatively high rate in the Mahoning and Shengango Valleys, requiring large ore reserves.

Both the independents and Steel Corporation subsidiaries in this district are commencing to establish substantial coal stocks, against possible interruptions to freight movement during the winter. Possibility of another coal strike next April is also a stimulant in this respect. Heavy tonnages of coal and coke are being stored by the Ohio Works of the Carnegie Steel Co.

Labor conditions with the mills are satisfactory. Employment managers state that no efforts are being made by the plants to recruit workers among Southern negroes, as reported by some interests.

\*Metallurgical engineer, 50 Church Street, New York.

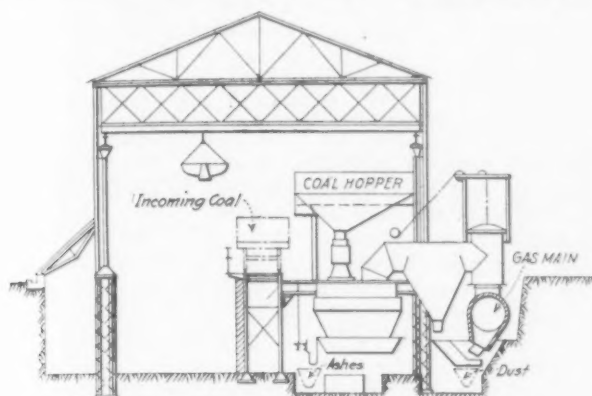


## MORGAN PRODUCERS IN BRITAIN\*

### 57 Gas Machines Installed in England, Scotland and Wales Since 1919

Since the Morgan gas machine was introduced into American steel plants, in 1914, some 400 have been installed there and 100 in other countries. In Great Britain the first machine was started in the spring of 1919. During 1919 and 1920 trials were carried out to ascertain what the machine could do on different British fuels. In spite of the trade depression, 57 machines, with a yearly gasifying capacity of over 500,000 tons of coal, have since then been installed here, 30 of them as repeat orders.

In some instances new plants of Morgan machines have been constructed, but more usually they have been

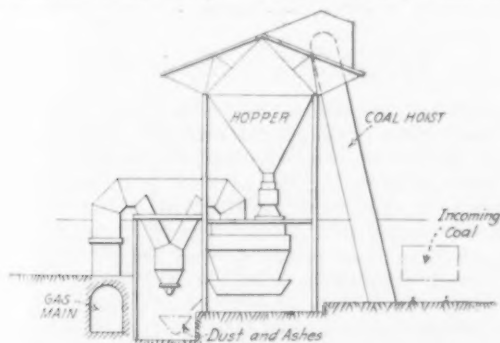


Section Through Gas-Making Plant at Stewarts & Lloyds Works, Coatbridge, England, Showing How Coal Is Handled and Gas Taken Off

put down to replace existing plant, and we understand that over 150 producers in the country, of various types, have now been replaced by these gas machines. In one steel plant 10 machines are doing the work of 54 old producers, and at the same time the output of steel has been considerably increased. These machines are particularly noted for their simple, heavy design and construction; for their labor-saving features, for high-quality gas and for large capacity. It is shown that 3000 lb. of coal per hour, and even more, can in most cases be gasified.

#### Savings in Fuel and Labor and Increased Output

The makers claim the following savings in labor, fuel and increased output reached during 1920-1922 at



At the Plant of the Grovesend Steel & Tin Plate Co., Gorseinon, England, Coal Is Hoisted by Conveyor Buckets and Discharged into the Overhead Hopper

steel works in England, Scotland and Wales by replacing existing gas producers with Morgan producer-gas machines:

	Savings in coal con- sumption. Per Cent	Savings in labor. Per Cent	Increased steel pro- duction. Per Cent
Steelworks A.....	23	52	15
Steelworks B.....	32	63	15
Steelworks C.....	27	68	20
Steelworks D.....	20	60	10

\*From an article in *Iron and Coal Trades Review*, London, England.

The figures are arrived at after 9 to 18 months' actual working, not including lock-outs, strikes, protracted stoppages of plant, holidays, etc. (except in the case of steel works D, where the figures refer to a shorter period). The saving in coal is compared with the fuel consumption when the same kind of coal was previously used. In two of the works it has been possible to run the furnaces on separate Morgan gas machines, at the same time other furnaces of exactly the same design have been working on other producers. The same proportion of pig iron and scrap has been used to produce the same steel, with the same kind of fuel. Therefore, the comparison is as correct as possible.

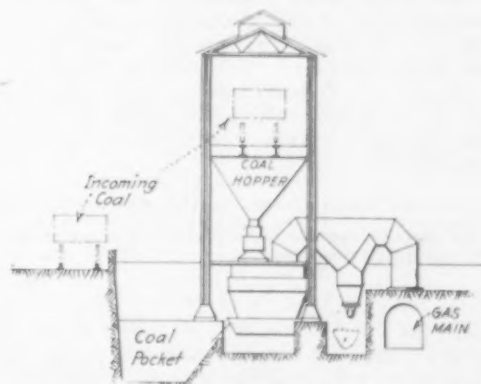
In many plants the gas producers are often neglected, although in many respects they are the most important part of the steel making plant. It is stated that on certain plants the [annual] saving in labor only is enough to cover 25 per cent of the total cost of the gas machine plant.

From the figures given in the above table the saving in fuel can evidently, in most cases, be safely stated at 225 lb. per ton of steel. In one case a saving of over 335 lb. per ton has been verified. Assuming coal at £1 per ton, the [annual] saving in fuel on a plant producing 100,000 tons of steel per year would be £10,000, which would cover 30 to 40 per cent of the total outlay for the Morgan gas plant. It is therefore evident that the yearly saving in labor and fuel alone will cover at least 60 per cent of the total outlay for a new gas plant.

The saving from increased output is perhaps even more important than the saving in labor and fuel; this of course especially refers to busy times, which must return some day. The spreading of overhead charges over a larger output, and the additional profit on that, can best be calculated by the steel maker himself. The cost for power, water and oil will be more than offset by the saving in steam.

#### Steel-Making Capacity

In one British plant five such machines serve, without reserve, two 60-ton and three 35-ton open-hearth



Railroad Cars Deliver Coal, at the Rotherham (England) Plant of Steel, Peech & Tozer, Ltd., Either to a Coal Pocket or Directly into the Hoppers, from an Overhead Track

furnaces, all the soaking pits, and also the sand furnaces and ladle-heaters. The average gasification per producer per hour is given as 2780 lb.

In another plant the basic open-hearth furnaces average 500 tons of steel per furnace-week from cold stock. One gas machine is employed per furnace, and has proved more than ample. The same result has been arrived at in an acid plant with furnaces of the same size. In another works four machines serve three 60-ton furnaces, and a fourth furnace will be put on to the same battery.

In one works coal of such clinkering nature had to be used that, on the older producers, from 3 to 6 hr. per day of poking was required to break down the clinkers formed. These coals were also very dusty. Tests showed that 58.7 per cent passed ¼-in. mesh; 19.6 per cent passed ½-in. mesh; 8.3 per cent passed ¾-in. mesh; and only 13.4 per cent was above ¾-in. mesh. During three months an open-hearth furnace,

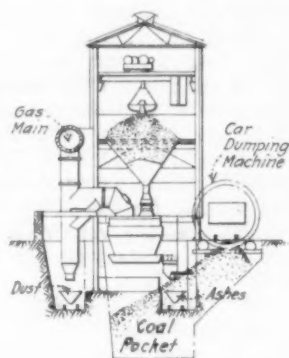
producing 450 to 500 tons of steel per week, was run by one Morgan gas machine on the above fuel, without any reserve, and not one hour was lost due to the gas. The coal consumption was considerably decreased below previous practice and the output of steel increased.

This indicates that such dusty and caking fuel can be gasified by the gas machines to advantage and without making clinkers; 3000 lb. per hour of this coal is possible per machine, but a slower rate is recommended on such a dusty fuel. It has also been proved that the machine will gasify coal which expands to such an extent that it cannot be used in an ordinary producer.

#### Quality of Gas

Owing to the uniform composition of the fuel bed, every particle of rising air and steam on its way upward is brought into intimate contact with the fuel,

Each Gas Machine Here Has Its Own Ash Bunker, Which Is Dumped Periodically into Buggies Below. The coal tippler dumps carloads of coal into the coal pit, whence it is taken by grab bucket on the crane and delivered into the individual hoppers



and no holes can be formed in the fuel bed through which the air and steam can rush without coming in contact with the coal. By these means only is a high quality of gas obtainable concurrently with a high rate of gasification.

In the table are given results obtained from Morgan gas machines in British works during two consecutive months of operation under ordinary conditions, the plant and tests being worked by the regular staff. The average rate of gasification per producer per hour was 2418 lb. of coal. The gas was analyzed by continuous 24-hr. samples. The results, based on complete average of all tests, are substantially the same as those given in the table, which are based on average of Tuesdays and Fridays only, so as not to make too elaborate a table.

Twenty-four Hours Continuous Samples of Gas From Morgan Producer-Gas Machines, Taken Every Tuesday and Friday for Two Months, During Ordinary Operating Conditions.

Date, 1922	CO <sub>2</sub> Per Cent	CO Per Cent	H Per Cent	CH <sub>4</sub> Per Cent	N Per Cent	Com- bustible gas. Per Cent
May 2	5.30	25.50	9.91	4.26	55.03	39.67
May 5	5.80	23.40	14.44	4.16	52.20	42.00
May 9	3.30	29.68	14.05	3.22	49.75	46.95
May 12	3.20	28.00	11.05	4.48	53.27	43.53
May 16	3.40	28.30	12.90	4.50	50.90	45.70
May 19	4.20	26.95	14.79	3.85	50.21	45.59
May 23	6.00	26.22	15.09	4.38	48.31	45.69
May 26	5.00	26.15	14.72	4.15	49.98	45.02
May 30	4.90	26.04	14.91	3.56	50.59	44.51
June 2	5.10	26.89	15.59	3.05	49.37	45.53
June 6	4.60	27.37	14.37	3.83	49.83	45.57
June 9	3.60	25.45	14.79	3.35	52.81	43.59
June 13	6.30	25.20	15.97	4.20	48.33	45.34
June 16	4.60	25.30	14.32	3.25	52.53	42.87
June 20	5.20	26.70	15.47	3.30	49.33	45.47
June 23	6.00	26.75	15.45	3.48	48.32	45.68
June 27	5.30	25.63	15.30	3.97	49.80	44.90
June 30	5.40	25.61	15.05	3.09	50.85	43.75
Average	4.84	26.39	14.34	3.78	50.63	44.52

#### Labor

The labor required for running a gas-machine plant will depend on the size of the plant and on the mechanical facilities for bringing coal to the feeds of the machines and for handling the ashes. In one British plant, consisting of five Morgan machines gasifying 800 to 900 tons of coal per week, three men per shift do all the work around the machines, including the delivery of ashes into standard railroad cars. An additional man operates the grab bucket crane supplying the producers during the day shift only, and the coal

cars are discharged by the regular staff serving all the different departments.

In a case recently investigated, before reconstruction the total staff on the gas plant, including three foremen and the unloaders, was 104 men. In this case the coal was discharged by hand onto the producer stage, and the ash was removed by a hoist. A Morgan plant, properly equipped to do the same work, would need the following labor staff: Gas and ash men (4 per shift), 12; foremen (1 per shift), 3; crane men (1 on two shifts), 2; unloaders (2 on one shift), 2; total, 19. These 19 men are sufficient for a plant producing all the gas for a steel plant with a capacity of 200,000 tons per year. Assuming that these men were paid on an average £3 per week, the saving in labor alone, per year, would cover more than 25 per cent of the total cost of the gas-machine plant, including everything above and below ground.

#### Repair and Maintenance

In these machines the only part liable to wear out rapidly is the leveler which, by means of counterweights, is pressed against the surface of the fuel bed over which it slides. Only the part actually touching the coal requires periodical renewal. We understand that the cost of a new leveler bar is about £15, and that it will last from nine months to two years, depending on the nature of the coal. Even on coking coal, which is the most cutting, the leveler claims a life of at least nine months, while it can be replaced in half-an-hour, from stop to start. A new quality of steel is now being provided, which is expected to last considerably longer.

It is also probable that the feed drum may wear out in from three to four years. Its cost is about £14, and it can be replaced in two hours. Bushings may also need replacing after a time. Replacement of other parts can be due only to accidents, neglect, faults impossible to detect in manufacture, or inferior material. The makers claim, however, that the cost per machine per year, averaging all the machines in the country, should not exceed £5. On this basis it is safe to say that a maintenance cost of £25 per year per machine, including labor, should be well on the safe side. We understand that actual figures gathered from practice in the United States come considerably below this figure.

At one plant, where the Morgan gas machine has been previously employed and thoroughly studied, a high-capacity mill, costing perhaps £250,000, was built. To heat the steel for this mill one Morgan machine is installed, which means that if anything went wrong with the machine, the mill would be brought to a standstill, as there is no other means of heating the steel.

#### Electric Power Production

Reports of the United States Geological Survey reflect the increased industrial activity of the past few months in the larger production of electric power, the gain from June to October in electric units being 12.5 per cent. In June 3835 millions of kwhr. were produced, advancing to 4313 millions in October. All of this gain came from power derived from fuels, for the water power showed the usual seasonal decline as available water supply fell off. The coal consumption was increased between June and October from 2,486,000 tons to 3,247,000 tons, in spite of bad conditions due to the coal and railroad strikes.

Briggs & Turivas, Inc., Chicago, dealer in scrap iron and steel and salvaged material, has purchased the plant of Frederick Cowin & Co., Inc., Joliet, Ill., formerly the Joliet Rolling Mills. The plant is completely equipped, consisting of a combination 8-in. and 12-in. finishing mill, 12-in. and 16-in. finishing mills and a 22-in. muck mill. It has a capacity of 5000 tons monthly of finished material and five railroads serve the property. Whether the plant will be sold by Briggs & Turivas, Inc., as a going proposition or dismantled has not yet been decided.



## JUDGE GARY HOPEFUL

### Believes Country Will Enjoy Prosperity Unless Economic Laws Are Violated

Judge E. H. Gary, chairman United States Steel Corporation, has written an article for the January number of *System* on business conditions. He says in part:

"I cannot see other than good business ahead, provided natural economic progress is not interfered with. The greatest danger to the consistent and logical development of the country is in the possibility that attempts may be made to substitute unwise and sometimes vicious laws of man for the laws of Nature, thereby interrupting the even movement of supply and demand.

"To permit labor associations or farmer organizations to do, as the result of combination, things that are claimed to be beneficial to them but which are denied to others is to create classes, to favor some of them and to injure the whole body politic. It tends to array class against class, and it naturally adds to the cost of production. And be it remembered, the general purchasing public, in the end, must pay the bills. This, as a net result, is certain. This is not equal opportunity and equal obligation.

#### Organization of Groups

"There is no reason why any group should not organize to gain for itself a better economic position if it believes that through organization that position can be gained. But it is not in the public interest to permit any group secretly to expend large sums of money for subversive propaganda. The public is entitled to know the facts about the expenditures of money to influence public opinion.

"The surest and wisest of all regulation is public opinion, but sound opinions cannot be formed excepting on the facts. It is hardly possible to have serious industrial disturbance if all the facts are known. In the graver strikes of the last several years the facts have not been generally known.

"The progress of prosperity has been halted by these

strikes which could not have lasted so long in the face of an enlightened public opinion, and there will continue to be stoppages of trade as long as full publicity for every factor in trade is not compelled by law.

#### Vicious Bills Pending

"There are many vicious bills pending in Congress which bear upon economic progress. They tend to unsettle industry, to induce fear. It is no answer that the fears usually prove groundless. It is not so much that large expenditures are proposed as it is the spirit generally exhibited. Selfishness, greed and vindictiveness are displayed.

"It can be said with some positiveness that if we do not have prosperity this year it will be because of agitation and laws, no matter what their altruistic guise, which are directed against the general welfare. Neither the tariff nor the debts owing us from Europe out of the war will in my opinion have any considerable effect upon business. The tariff is, as always, unsatisfactory, and no satisfactory tariff bill will be passed until the two major political parties agree upon the principles of the tariff and take it out of politics. The saving grace of the tariff bill just passed is that its provisions may be modified by the President.

#### The Immigration Law

"Just at this time it is generally recognized that there is a shortage of labor, although now and generally there are considerable numbers of idle men who do not ask for or desire steady work. The shortage in labor, however, has come principally as the result of the percentage immigration laws which have limited the number of workmen who would now come to this country if not prevented by the laws referred to.

"These laws ought to be changed promptly. The restrictions upon immigration should be directed to the question of quality rather than numbers of foreigners coming to this country. Measures for limiting the number of immigrants to those who are clearly shown to be healthy morally, politically and physically, ought to be clear, strict and enforceable; but the number allowed to come here should be equal to the necessities of our industries."

## EFFECTS ECONOMIES

### Purchase of Iron and Steel and Other Products for Short Line Railroads

WASHINGTON, Dec. 12.—Organized in June, 1921, in Washington, with James W. Cain as manager of purchases, the Consolidated Purchasing Agency of the American Short Line Railroad Association has effected appreciable economies in buying iron and steel products and other materials and developing other plans of efficiency that have converted losses into profits. Still other methods of increasing efficiency in the conduct of the short line carriers are in contemplation. With this object in view, the offices of the agency were transferred on Dec. 1 from Washington to 616-618 Railway Exchange, Chicago.

The membership of the American Short Line Railroad Association consists of slightly less than 500 carriers, which in combination represents more than 25,000 miles of main line track and an investment of more than \$1,000,000,000. These roads vary from small logging lines a few miles in length up to interstate carriers of several hundred miles, made up of Classes 1 and 2 carriers.

#### Combining Purchases

While the Consolidated Purchasing Agency assumes no financial responsibility, being unincorporated, it acts as an instrument for combining the purchases of the many roads it represents and negotiates prices on a volume basis instead of the retail basis on which the individual small railroad formerly purchased its supplies.

No attempt has been made to cover all purchases, but rather the agency has proceeded conservatively and confined its efforts during the first year to those mate-

rials which were either standard or susceptible of standardization. For example, purchases of steel rails have been made in 500-ton lots and distributed to member lines in less than 500-ton shipments, which gave them the same advantage as the purchaser of 500 tons and more. Likewise, spikes and bolts are purchased in carload lots, and even though a small road may need only 25 kegs, it derives the benefit of the carload price.

It is hoped to establish three regional agencies during the coming year, one in the East, one in the South, and one on the Pacific Coast, to facilitate distribution of materials, which may be shipped in carload lots and reconsigned.

After an investigation covering the greater part of a year, augmented by answers to questionnaires sent all member lines throughout the United States and Canada, the Consolidated Purchasing Agency made recommendation and placed orders for more than \$250,000 worth of gasoline railroad motor car equipment, representing some 20 cars, which, Mr. Cain states, are showing excellent results on the different lines. He pointed out that they are replacing steam passenger trains, which were being operated at a loss, while the operation of motor cars is now showing a substantial profit.

#### Finance Corporation

Through the activities of Mr. Cain, a finance corporation is now being organized under direction of the association whereby member lines and others may acquire motor car equipment under a lease purchase plan, making it possible for the equipment to pay for itself through the saving effected. Mr. Cain states that this corporation will be ready to operate by the first of the year, when formal announcement will be made.

Work is also progressing satisfactorily in the direction of arranging for standard designs of cars and loco-

motives for the purpose of effecting substantial economies. It will also be possible, Mr. Cain declares, by using standard designs to arrange financing on a basis that could not be done where a variety of different designs were contemplated. Through the consolidation of the requirements of these lines, the quantity will be sufficient to justify liberal prices and terms, Mr. Cain states.

"Just as fast as these different problems are worked out," he added, "others will be taken up, such as combining the fuel requirements in different districts; grouping the insurance, and possibly evolving policies giving more complete coverage than heretofore; conversion of coal burning equipment to oil, where the combined locomotives are sufficient to justify lower prices and enable financing of the equipment and many other innovations which make for economy."

The transfer of the office of the agency to Chicago was necessitated by the increased volume of business being handled by this department which can best be taken care of from a more central point. There also was need of being located in an industrial and railroad center to facilitate procuring materials and equipment more promptly.

### Simplification of Food Containers

WASHINGTON, Dec. 12.—A preliminary meeting of representatives of associations and groups was held at the Department of Commerce last Wednesday to consider plans for the conference to be held on Jan. 16 at the department to consider the simplification of food containers.

It was decided upon recommendation by the National Wholesale Grocers' Association, represented by M. L. Toulme, New York, that simplification can be affected by a number of manufacturers using containers. It was also agreed that associations using the following seven commodities be divided into groups with the idea of simplification: Soap, and soap products and lye; extracts and spices; condensed and evaporated milk; all cereal manufactures; macaroni and noodles; salt; and baking powder.

It was decided that a larger representative of the important associations should be invited to the January meeting in order that as far as possible all those using metal, wood, glass, paper board and fiber box containers should attend, and to instill greater interest. The question of simplifying fruit and vegetable containers will be in charge of Russell W. Bennett, of the Southern Crate Manufacturers' Association, Jacksonville, Fla.

### Chicago Building Activity Sustained

In November permits were issued in Chicago for 1131 buildings, involving 37,961 ft. of frontage and \$20,443,000, as compared with 721 permits, 24,462 ft. of frontage and \$12,389,000 for November, 1921, an increase of about 65 per cent. The November figures also show an increase of 28 permits, 3167 ft. of frontage and \$5,446,850 over October of this year. If the same rate of activity is maintained through December, the permits for the entire year will involve a total cost of \$210,000,000, a gain of 70 per cent over 1921.

### Increased Industrial Activity

Figures of the Department of Commerce show that the increase in activity during October exceeded the estimates. Among other things the month showed the largest output for any month since 1920 in pig iron, steel ingots, coke, copper, zinc, cement, brick, maple flooring, North Carolina pine, petroleum, knit underwear and in consumption of cotton, silk and newsprint paper. Corresponding increases are shown in activity in all distributive movements, including department stores, chain stores and mail order houses as well as wholesale trade.

Production of copper is given at 103,273,000 lb., compared with 96,408,000 lb. in September and with only 24,614,000 lb. in October, 1921. Production of zinc is

shown likewise at 79,880,000 lb., compared with 66,268,000 lb. in September and with 29,034,000 lb. in October, 1921. Production of petroleum is given as 47,255,000 bbl., compared with 45,291,000 bbl. in September and with 35,539,000 bbl. in October, 1921. Building construction shows a slight falling off in September, the index number being 127 against 129. Costs of building increased during the month, the index number for frame houses advancing from 193 to 196 and of brick houses from 197 to 199.

### Steel Corporations' Unfilled Orders Decrease

The United States Steel Corporation on Nov. 30 last had 6,840,242 tons of unfilled business on its books, or 62,045 tons less than on Oct. 31. This decrease is the first one reported since February, when one of 100,609 tons was shown, following a decrease of 26,736 tons in January. In October the unfilled business increased 211,680 tons; in September, 741,502 tons; in August, 173,944 tons; in July, 140,630 tons; in June, 381,303 tons; in May, 157,315 tons; in April, 602,765 tons; and in March, 353,079 tons. A year ago the corporation had 4,250,542 tons of unfilled business on its books, or 2,589,700 tons less than it has to-day.

Following is the unfilled tonnage as reported by months since January, 1919:

	1922	1921	1920	1919
Jan. 31.....	4,241,678	7,573,164	9,285,441	6,684,268
Feb. 28.....	4,141,069	6,933,867	9,502,081	6,010,787
Mar. 31.....	4,494,148	6,284,765	9,892,075	5,430,572
Apr. 30.....	5,096,913	5,845,224	10,359,747	4,800,685
May 31.....	5,254,228	5,482,487	10,940,465	4,282,310
June 30.....	5,635,531	5,117,868	10,978,817	4,892,855
July 31.....	5,776,161	4,830,324	11,118,468	5,578,661
Aug. 31.....	5,950,105	4,531,926	10,805,038	6,109,103
Sept. 30.....	6,691,607	4,560,670	10,374,804	6,284,638
Oct. 31.....	6,902,287	4,286,829	9,836,852	6,472,668
Nov. 30.....	6,840,242	4,250,542	9,021,481	7,123,336
Dec. 31.....		4,268,414	8,148,122	8,265,366

The largest total of unfilled orders was on April 30, 1917, when it was 12,183,083 tons. The lowest was on Dec. 31, 1910, at 2,605,747.

### Research on the Corrosion of Steel Pipe

The National Tube Co., Pittsburgh, has announced the establishment of an industrial fellowship in the Mellon Institute of Industrial Research of the University of Pittsburgh, Pittsburgh. A systematic study is to be made of practical methods for the prevention of corrosion in hot water supply systems. Attention will also be given to the classification of waters of various chemical composition, with respect to their relative corrosive action upon iron and steel, particularly in the form of pipe lines, boiler economizers, tubes, etc.

The present incumbent of the Fellowship is Clifford R. Texter, who for the past several years has been carrying out research on the corrosion of iron and steel, where not exposed directly to the atmosphere. Mr. Texter welcomes correspondence with engineers and manufacturers interested in the field to which his industrial fellowship relates.

### Symington Plant at Chicago Purchased

The former Symington Co. plant, until recently a depot of the United States Ordnance Department, Seventy-fourth and Ashland Avenue, Chicago, has been purchased by A. Harris and associates, composed principally of the executives of Harris Brothers Co., dealer in salvaged material. The purchase, however, has no connection with the Harris Brothers Co. A portion of the plant will be leased to Harris Brothers Co. to be used for the extension of its house and garage construction operations. The rest of the works will be leased or sold for manufacturing and storage purposes. The property extends 3400 ft. west from Ashland Avenue and covers practically 13 city blocks. It is served by the Belt Railway of Chicago and other lines, and is in the center of a well populated district. The buildings are of modern construction and cover 700,000 sq. ft. It is the intention of the buyers to improve the vacant property included in the purchase.



## REFRACTORIES DULL

### Lower Prices Are Named for Silica and Magnesite Brick

PITTSBURGH, Dec. 11.—Fire clay brick prices are holding fairly well in Pennsylvania and the Central West, but in Ohio and Kentucky the market is weaker, and a few days ago makers of Pennsylvania and Chicago silica brick announced a reduction of \$3 per 1000. The latter development is a natural sequence of the competition provided by some of the smaller producers who have been so much in need of business that they have not been paying much attention to the established quotations.

There also has been a reduction of from \$2 to \$5 per ton in the price of magnesite brick. This change may be ascribed to the fact that users quite generally stocked up heavily before the enactment of the Fordney tariff law, and those companies who did not pursue this course have been substituting chrome brick quite freely for magnesite. The "official" quotation on magnesite brick is now \$68, but some producers are known to have gone as low as \$65 to obtain business. Makers of chrome brick are quite generally holding to \$50 per net ton at works for standard sizes, and it is stated that this

price now is not being shaded as it was a few weeks ago.

Business is seasonably quiet in practically all lines, although there are a few good-sized inquiries out in connection with new open-hearth furnace construction. A Cleveland steel company, which is adding to its steel works capacity, has an inquiry out for 750,000 brick. The more common impression is that the next change in fire clay brick will be downward because producers are finding considerable resistance among large consumers to paying current prices, and it is a fact that with coal prices down materially from their early fall levels, it has been possible to decrease production costs.

We quote per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania .....	\$43.00 to \$46.00	\$38.00 to \$41.00
Ohio .....	40.00 to 42.00	35.00 to 38.00
Kentucky .....	41.00 to 43.00	37.00 to 40.00
Illinois ..	43.00 to 45.00	40.00 to 42.00
Missouri ..	43.00 to 45.00	38.00 to 42.00
Ground fire clay, per net ton.....		7.50 to 8.50
Silica Brick:		
Pennsylvania .....		42.00
Chicago .....		47.00
Birmingham .....		48.00
Ground silica clay, per net ton.....		8.00 to 9.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....		65.00 to 68.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....		43.50
Chrome Brick:		
Standard size, per net ton.....		50.00

## COAL OUTPUT

### Tonnage of Bituminous Almost as Large as for Preceding Year

WASHINGTON, Dec. 12.—Reports to the Geological Survey indicate a total production of about 11,100,000 tons of bituminous coal during the week of Dec. 4 to 9. The estimated cumulative production of bituminous coal this year to Dec. 2, inclusive, stands at 365,387,000 tons, which is 11,899,000 tons or 3 per cent less than in the corresponding period of 1921; 139,979,000 tons or 28 per cent less than in 1920; 59,717,000 tons or 14 per cent less than in 1919; 174,809,000 tons or 32 per cent less than in 1918; and 145,032,000 tons or 28 per cent less than in 1917.

Shipments of bituminous coal from lower Lake Erie ports declined in the week ended Dec. 3, and the season virtually came to a close on that date. Reports furnished by the Ore and Coal Exchange show that 554,525 net tons were dumped, of which 535,505 tons were cargo coal and 19,020 tons were vessel fuel. Cumulative dumpings during the present season to Dec. 3 stood at 18,991,482 tons, a decrease of 18 per cent when compared with the average for the three years preceding. Of the 18,171,965 tons of cargo coal dumped to date, 1,149,063 tons, or 6.3 per cent, were consigned to destinations not ordinarily taking Lake coal.

The total output is estimated from the railroad shipments at 292,000 net tons, an increase of 4,000 tons over the week before.

The United States Geological Survey's estimate of beehive coke production in 1921, made in March, was substantiated by final returns from the producers. These reports show that the total output was 5,538,042 net tons, the smallest record since 1885 and 73 per cent less than in 1920. By-product coke continued to supersede the beehive oven variety, and of the 25,287,622 tons of coke produced in 1921—both beehive and by-product—but 22 per cent of the total came from beehive ovens against 40 per cent in 1920.

### Orders as to Movement of Coal Are Canceled

WASHINGTON, Dec. 12.—Virtually all of the service orders which have given priority to the movement of coal since the strike were canceled last midnight by the Interstate Commerce Commission. The one remaining restriction is the requirement that all shipments must be forwarded by the most direct of routes available regardless of the normal traffic arrangements between carriers.

At the same time of the cancellation of the service orders, the commission also canceled the open top car regulation which has been a source of particular inconvenience to the iron and steel industry. The regulation governing the movement of this type of equipment is continued only in a few territories where individual railroads have been specifically required to furnish certain coal cars to designated mines for the purpose of supplying fuel to communities or buyers in particular need of coal.

## Cement Rates Declared Unjust

WASHINGTON, Dec. 12.—In a proposed report regarding the complaint of the Atlas Portland Cement Co., Examiners John E. Keller and John T. Money, recommended that the commission wipe out the intrastate cement rates in Indiana and Illinois as unduly prejudicial and unduly preferential to mills in those States, the re-creation of Scale 1 territory, to be composed of Illinois and Indiana and southern Wisconsin, the establishment of a scale of rates intermediate between Scale 1 and Scale 11 as they existed before Scale 1 and Scale 11 territories were merged into Scale 11 territory, and the denial of all applications for the establishment of key rates. In addition, they recommended the strict application of the mileages, advising the commission not to grant the prayer of the carriers for privilege to apply the scales by the method they use in applying the class scale in central territory. The report also covers complaints of the Universal Portland Cement Co. and the Missouri Portland Cement Co.

## COMING MEETINGS

### January

American Engineering Council. Jan. 11 and 12. Annual meeting, headquarters of Federated American Engineering Societies, 24 Jackson Place, Washington. L. W. Wallace, 24 Jackson Place, Washington, N. W., secretary.

### February

American Institute of Mining and Metallurgical Engineers. Feb. 19 to 21, inclusive. Annual meeting, Engineering Societies Building, New York. Dr. F. F. Sharpless, 29 West Thirty-ninth Street, New York, secretary.

## INCREASE IN COPPER USE

### Research Association Points to Larger 1922 Consumption—Elects Officers

At the second annual meeting of the members of the Copper and Brass Research Association, held Dec. 5 at its offices, 25 Broadway, New York, the following were elected directors to serve for the ensuing year, the first eight mentioned comprising the executive committee:

R. L. Agassiz, president Calumet & Hecla Mining Co.; Walter Douglas, president Phelps Dodge Corporation; C. F. Kelley, president Anaconda Copper Mining Co.; Stephen Birch, president Kennecott Copper Corporation; Charles Hayden, vice-president Chino, Utah, Nevada, Ray companies; F. S. Chase, president Chase Rolling Mills; Edward H. Binns, president C. G. Hussey & Co.; H. J. Rowland, sales manager Rome Brass & Copper Co.; J. W. Allen, treasurer Green Cananea Copper Co.; Henry F. Bassett, president Taunton-New Bedford Copper Co.; H. C. Bellinger, vice-president Chile Exploration Co.; F. H. Brownell, vice-president American Smelting & Refining Co.; J. Parke Channing, vice-president Miami Copper Co.; Carl F. Dietz, president Bridgeport Brass Co.; B. Goldsmith, president National Brass & Copper Co.; E. O. Goss, president Scovill Mfg. Co.; Robert H. Gross, president East Butte Copper Mining Co.; U. T. Hungerford, president U. T. Hungerford Brass & Copper Co.; C. V. Jenkins, treasurer Utah, Chino, Ray, Nevada companies; H. B. Paul, auditor Calumet & Arizona Mining Co.; R. M. Raymond, director United Verde Extension Mining Co.; A. E. Seelig, manager Michigan Copper & Brass Co.; W. Parsons Todd, manager sales Copper Range Co.

The directors elected the following officers: President, R. L. Agassiz; vice-presidents, C. F. Kelley, F. S. Chase, E. J. Rowland, Walter Douglas and U. T. Hungerford; treasurer, Stephen Birch; secretary, G. A. Sloan; and manager, William A. Willis.

In connection with the conclusion of the first full year of the association's activity as an unincorporated, voluntary organization of the brass and copper industries R. L. Agassiz, president Calumet & Hecla Mining Co., who is president of the Copper and Brass Research Association, said:

"The research and educational work of the Copper and Brass Research Association has played an important part in the rapid growth of consumption of brass and copper during the past year, for, despite uncertain business conditions, copper consumption in this country is now substantially greater than in pre-war years. Having digested an unprecedented quantity of war-time scrap metal, the industry is now again in a strong position.

"The underlying purpose of this whole effort is to develop to the maximum the domestic consumption of the metal. Export trade will always be a large factor, but it will be possible, we believe, to so augment the American use of the metals that the varying industrial pulse of Europe will be much less influential in determining the prosperity of the industry.

"In this connection, it is interesting to note that while the 1922 consumption of copper and brass in the building industry in this country was about 150,000,000 lb. (an increase of over 100,000,000 lb. as compared with 1921), yet the potential market for copper and brass in the building industry alone is placed at approximately 650,000,000 lb. annually.

"The constantly growing domestic use of brass, which is only next to the electrical industry as a consumer of copper, is another helpful factor.

"The electrical industry, where the physical properties of copper are indispensable, is in reality only in its infancy. The high cost of fuel, with uncertain and expensive transportation, is responsible for the growing use of electric power generated at central points, distribution over wide areas being possible economically because of copper's high conductivity.

"Our plan is to provide through the instrumentality of the Copper and Brass Research Association a technical and advisory service which may be freely called

upon by users of our metals, a service which no copper or brass producer or manufacturer could reasonably be expected to undertake alone. Already wide use is being made of these facilities. Information has been furnished on the use of copper and brass for almost every conceivable subject, from safety pins to locomotive boiler tubes.

"An important accomplishment has been the fact that many of the more than 2000 manufacturers who produce articles made of brass or copper have taken advantage of the association's activity to individually advertise their products, thus extending the association's own educational work.

"The association has found a ready response all over the country to its campaign directed toward eliminating waste in industry and in the home by the use of non-corrodible metal, a waste the size of which was demonstrated by a survey conducted by the association, showing that rusted metal in homes alone costs home-owners more than \$600,000,000 annually, about five or six times as much as the fire loss."

The following are now members of the Copper and Brass Research Association: Association Smelting & Refining Co., Anaconda Copper Mining Co., Arizona Commercial Mining Co., Braden Copper Co., Bridgeport Brass Co., Calumet & Arizona Mining Co., Calumet & Hecla Mining Co., Chile Exploration Co., Chino Copper Co., Chase Rolling Mills, Chase Metal Works, Copper Range Co., Engles Copper Co., East Butte Copper Mining Co., Greene Cananea Copper Co., U. T. Hungerford Brass & Copper Co., C. G. Hussey & Co., Inspiration Consolidated Copper Co., Kennecott Copper Corporation, Michigan Copper & Brass Co., Miami Copper Co., Mother Lode Coalition Mines Co., National Brass & Copper Co., Nevada Consolidated Copper Co., New Cornelia Copper Co., New England Brass Co., North Butte Mining Co., Old Dominion Co., Phelps Dodge Corporation, Ray Consolidated Copper Co., Rome Brass & Copper Co., Scoville Mfg. Co., Shattuck Arizona Copper Co., Taunton-New Bedford Copper Co., United Verde Extension Mining Co., Utah Copper Co., and Utah Consolidated Mining Co.

### Chicago Merger Planned

The Inland Steel Co. and the Steel & Tube Co. of America, both with headquarters at Chicago, are negotiating for a consolidation of their properties, but as yet have come to no agreement. Both companies figured in the five-company merger planned last spring which included the Midvale Steel & Ordnance Co., Republic Iron & Steel Co., and the Youngstown Sheet & Tube Co. This was finally abandoned and a consolidation of the Midvale, Republic and Inland companies was then brought to the point of consummation, but it was likewise dropped. The Inland and Steel & Tube Co. works adjoin at Indiana Harbor, Ind., and form logical units of a single large plant such as will be made possible if the merger of the two corporations takes place.

### Wages of Telegraphers Reduced

CHICAGO, Dec. 9.—The United States Railroad Labor Board last night rendered a decision, effective Jan. 1, 1923, which cuts off approximately \$1,500,000 annually from the wages of 11,000 railroad telegraphers employed by 11 Class I railroads, including the Chicago & North-Western, the Chicago, Burlington & Quincy, the Chicago, Milwaukee & St. Paul, the Chicago, Rock Island & Pacific, the Chicago, St. Paul, Minneapolis & Omaha, the Minneapolis & St. Louis, the Great Northern, the Illinois Central, the Minneapolis, St. Paul & Sault Ste. Marie, the Northern Pacific and the Southern Pacific (Pacific system).

President John Stevenson, Jr., of the Standard Tank Car Co., Sharon, Pa., states that unfilled orders on the company's books aggregate \$8,000,000, sufficient to keep the plants operating at a capacity rate until next June.



## Octogenarian pays high tribute to steel makers



**A. B. FARQUHAR**, for over 50 years a reader of *The Iron Age*, tells the story of his long and useful life. Unusual experiences of war and peace.

**T**HE First Million the Hardest is the somewhat misleading title of the intensely interesting autobiography by A. B. Farquhar, in collaboration with Samuel Crowther, recently published by Doubleday, Page & Co. Despite its title, which one is inclined to suspect was selected by Mr. Crowther rather than by Mr. Farquhar, this book is not a guide to making millions and is not a volume in which the idea of the dollar predominates, for running through it is evidence of the high ideals of a man who has loved to serve his fellowmen.

The first chapter, "The Quest of the Million-Dollar Secret," in which Mr. Farquhar tells of his visits to A. T. Stewart, William B. Astor, James Gordon Bennett and others, when he was a very young man, is as full of interest as the story which Edward Bok tells of his visits to the great literary men of New England when he was in his teens. Mr. Farquhar's account of how he was "captured" by Abraham Lincoln after having "sold" York to the Rebels, is a chapter that chains the attention and excites admiration for the young patriot whom the great President enlisted in the Union cause. In telling of the business side of the war, Mr. Farquhar relates a few of the unpleasant experiences of which he had knowledge, showing the gross frauds that were perpetrated against the Government. When Mr. Farquhar called the attention of Secretary Stanton to some flagrant offenses, he was surprised to learn that the Secretary was entirely familiar with what was going on, but felt helpless to prevent it. In comparing business methods of Civil War days and earlier times to those of recent years, Mr. Farquhar shows his cheerful optimism and the ability of an old man to see how, in some respects at least, conditions to-day are better than they were in the past. This optimism is also shown in Mr. Farquhar's narration of events connected with several periods of depression.

In conclusion Mr. Farquhar asks: "What does it all mean? What have these years taught me?" These are the principles which he lays down:

(1) *That it is, as a rule, safe to trust human beings. Comparatively few are unfair, if you are fair yourself.*

(2) *That troubles and apparent difficulties are but stepping-stones to progress—the most practical way of learning—and, as John Sherman said, "The way to resume is to resume."*

(3) *That there is nothing that will take the place of work, either to gain success or to gain happiness or to gain both—and I think it is possible to gain both if, in the striving and working for success, the dollar is not put above the man.*

(4) *That one can and must keep faith with oneself.*

(5) *That God is not mocked. You cannot break His laws without suffering.*

(6) *That one's only dangerous enemy is oneself. In the ultimate no one can hurt you but yourself.*

(7) *That friends are among the greatest assets—and the way to get friends is to be a friend.*

(8) *That one should never seek anything for which one does not give value. This avoids the disposition to speculate—which is one of the greatest dangers that beset the business man.*

"Following these rules," says Mr. Farquhar, "the world grows in interest and life is happier with gathering years."

Throughout his business career, Mr. Farquhar has been a buyer of steel, and in reply to a request from *THE IRON AGE* as to whether he would like to say

anything of special interest to iron and steel manufacturers in connection with the publication of his autobiography, Mr. Farquhar has written as follows:

"The interest my book seems to have aroused throughout the country has surprised me. I was induced to write it at the earnest request of some of my friends, who insisted that my experiences

were too valuable to be buried with me, and I am 84 years old this week, still in good health. I am just about leaving for directors' meeting of the Chamber of Commerce of the United States, to be held in Omaha, Neb. I am honorary vice-president and one of its founders.

"I have been a reader of *THE IRON AGE* for half a century, or I may say since its first issue. The journal never was better or more interesting than at present. I haven't time to give it the attention, however, that I used to when the active head of the business of A. B. Farquhar Co., Ltd. I am still its president.

"I have watched the steel interests grow from their beginning. Was an intimate friend of Andrew Carnegie, whom I loved; never went to New York without calling to see him, and his death left a vacancy that will be hard to fill. I regard him as in many respects the ablest business man of the century. It was certainly true of him that he made the United States the iron and steel center of the world at that early date, though it would have come sooner or later because of our natural resources.

"Well, as civilization has advanced from the time of the cave dweller, we had the stone age, the bronze age, the iron age, and now the steel age. The cheaper methods of making steel in the open hearth and Bessemer process have done more to add to the material wealth and consequent civilization of the world than anything else, at least in modern times. I have lived through about the most interesting period of the world's history, covering the invention of the telephone (I knew Graham Bell and witnessed his tests at the Centennial in '76, and was at dinner with him when Vail and others were discussing the propriety of making it of commercial value), of the motor car, airplane, etc.

"The manufacture of steel has grown to be so large and important as to raise the character of those who have engaged in it. For instance, in July, '79, when the panic of '73 was closing, I met the president of a Pittsburgh steel company in Atlantic City. We lunched together on Sunday. He turned to me and said, 'I have been buried here resting for a week or two, but don't you think that matters are mending?' I knew they were. He said, 'Would it not be a good idea to lay in a stock of steel?' I suggested I would take 1000 tons at a price named. He said I should double it, or use the thousand tons as a multiple and he would accept, although the price was low. I said all right. That is every word that passed between us, and although steel nearly doubled in price, without a word my entire order was filled, which, by the way, was doubled. After the armistice when able men connected with stabilizing prices tried to get a reduction in the price of steel, Judge Gary agreed to a base of 2.35c. Steel was being sold as high as 4c. at the time. Walter Hines, then in charge of railroads, made the great mistake of not agreeing to this, but the judge, having offered this price to the world, maintained it, although the independents still held to the higher prices. I do not believe there is a more honorable or higher class of men engaged in any business in this world than the steel makers."

## BLOW TORCH STEEL FURNACES\*

### Formation of the Open-Hearth Combustion System and What It Means

If an open-hearth port had only one function to perform, namely, to act as a gas burner, its design would be relatively easy but, since it must act also as a passageway for waste gases, it has always been designed as a compromise to meet its two quite different functions. As a result, ports have been made too large for proper combustion on the incoming end, and too small for outlet of the products of combustion on the outgoing end.

A gas port, on the incoming end, like any other burner should be designed to induce rapid and intimate mixture of fuel and air in order to produce high flame temperature and at the same time cause the flame to travel at high velocity, and with good control. To produce this condition, while at the same time providing amply large areas for flow of waste gases leaving the hearth—these gases though greater in volume to travel at lower velocity—involves necessarily the introduction of means of alternately restricting and enlarging the areas of each port end. This is accomplished by the Open-Hearth Combustion System.

The Open-Hearth Combustion System embraces what were formerly known as McKune and Egler types of open-hearth furnaces as well as several other types of some similarity to them. The McKune and Egler furnaces were developed quite simultaneously. The McKune patents became the property of Miami Metals Co. of Chicago, and the Egler of Arthur G. McKee Co. of Cleveland. It was soon realized that both groups had furnaces of very considerable merit but at the same time that the patent situation was such as to seriously hamper exploitation of either furnace due to the more or less justifiable fear of steel plant executives of becoming involved in patent dispute by their adoption of either furnace. By the formation by the Miami and McKee groups of a trusteeship, now known as the Open-Hearth Combustion System, they have not only eliminated the one large obstacle standing in the way of general adoption of this important improvement in open-hearth operation but they have made it possible now to offer furnace designs to the steel industry which are a composite of the best features of all the ideas previously held separately by them.

#### Three Types of Furnaces

The Open Hearth Combustion System now has three types of furnaces known as Type A, Type B, and Venturi. Type A furnaces are those in which the combined air and fuel are caused to pass through a port of fixed area known as the mixing port. In this type, the movable dampers or other restrictions are used to deflect the incoming air to the mixture port. In Type B furnaces the combined air and fuel is forced through a restricted opening defined by movable dampers.

In each of these types of furnaces the restrictions inserted in the incoming end are of course removed from the outgoing end so as to provide amply large passages for the waste gases from the hearth.

The Venturi type requires no special equipment and no moving parts in the port ends. Its merit lies in the novel design of furnace port ends, the lines of which are made to approximate those of the Venturi tube and, like the Venturi tube, the flow area can be much reduced without appreciable reduction in the amount of flow, for the reason that the gradual change of area causes inappreciable friction loss.

The Venturi furnace having no moving parts has of course the same port construction on each end. Its lines, however, permit a very great decrease of area through which the combined gas and air enter the furnace, this decreased area being at the same time ample to carry off as much waste gas as will the larger area of the conventional furnace, due to its easy flow lines. The restricted incoming area causes increased velocity

and better mixture of the air and gas than usual, this being accomplished without sacrifice of outgoing conditions. This type of furnace is a distinct improvement over conventional designs and its use makes an appeal because of the fact that this construction involves no added expense. These port ends are, however, still a compromise between the best incoming and outgoing conditions and results obtained from this type furnace have not been so satisfactory as those obtained from types A and B.

The formation of the Open-Hearth Combustion System has made it possible to design furnaces which, it is believed, will show still further improvement over the standard design than did either the Egler or McKune. These designs are only comparatively recent developments and but one furnace of the new design is in operation and a second one under construction. The performance of the new furnace gives promise of being in every way satisfactory, although it has been operating for too short a time to make any accurate judgment.

#### Results With Egler and McKune Furnaces

The performances of both Egler and McKune furnaces have in most installations come up to expectations. Where these furnaces have been installed and where conditions have been such as to give them a fair show, they have shown an increase in tonnage of approximately 20 per cent and a decrease in fuel of approximately 10 per cent. It is confidently felt that even these results will be improved as a result of developments now going on.

There is a point, however, which must be kept in mind in regard to installation and operation of these furnaces. Their successful operation requires more than just the installation of equipment. Due to their better methods of combustion they can handle and require more gas per hour than will a furnace of standard design. With the expectation of burning more fuel per hour it must be seen before installation is made that the effective draft conditions are such as to be able to handle an increased volume of waste gas. Furthermore, since the air supply is under fan pressure, it is necessary that the air checker chambers and the brick work in general be considerably tighter than in ordinary furnaces.

Furthermore, the action of the flame and the whole operation of the furnace is different than ordinary and consequently requires both the attention of the management and some little training of the furnace men themselves during the early days of operation to insure proper performance. There is nothing mysterious about the operation of this type furnace but there are certain methods to be learned and certain conditions to be maintained, failure to accomplish which will lead to unsatisfactory operation.

#### Economic Essay Prizes

Actuated by a desire to advance the study, and the more general appreciation of economics, Alvin T. Simonds, president Simonds Saw Co. of Fitchburg, Mass., and Chicago, proposes an essay contest open to pupils of high schools and normal schools in the United States and Canada. Mr. Simonds offers two prizes of \$1,000 and \$500 for the best essays written by students on the subject: "The Lack of Economic Intelligence and Some of the Injuries It Has Caused Individual and General Welfare in the United States Since 1860."

Mr. Simonds hopes this contest will interest in the study of economics many who might otherwise pass it by. He also expects it will aid in creating a public sentiment that will increase the practical study of the subject in secondary schools.

As a foundation on which the essays may be constructed Mr. Simonds suggests that facts and examples which bear on the subject should come from the history of the United States since 1860, with special emphasis upon the present.

Rules governing the contest have been prepared, and persons interested may obtain copies of them by addressing the Simonds Economic Prize Contest, 470 Main Street, Fitchburg, Mass.

\*From an address at the November meeting of the Pittsburgh Foundrymen's Association by E. J. McDonnell, entitled "Considerations in the Design of Open-Hearth Furnaces."



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## Equalization in Pig Iron

After several months in which the pig iron market has presented only one side, the past fortnight has witnessed a restoration of equalization, in whole or in part. For a long time consumers would purchase only against their pressing requirements, for they realized that prices were unnaturally high and they saw them in actual process of decline practically from week to week. Around the beginning of this month interest in first quarter deliveries began to appear, and already considerable business has been done for that period. It may not be impressive as pig iron tonnages sometimes go, but it is impressive as compared with the character of business done in immediately preceding months.

Using THE IRON AGE composite as a basis for comparisons, pig iron has declined about \$7 from its high point, which fell in the second half of September. Previously the advance from the low point of early in the year had been approximately double this amount.

In other words, an equalized, or partly equalized, market is developed, with buying for forward deliveries, when the market has declined one-half as much as it previously had advanced. From the viewpoint of early in the year, when the market was at its low point, the advance that ran from March to September inclusive was not expected, nor was it even expected that the market would advance during the year by the net amount now recorded, which is fully \$7 a ton. Instead, many furnacemen were asserting that their costs were too high to enable them to quote prices that would be attractive to pig iron consumers, and they continued to urge that freight rates be reduced so that they could assemble their raw materials more cheaply. Freight rate reductions were made July 1, but their influence is entirely lost in the much greater increases that have occurred in other items.

Wages in the iron and steel industry generally were advanced 20 per cent on Sept. 1, but the wage cost at the blast furnace is a relatively small item. The greatest difference is in the cost of coke, but even the advance in wages in the Connellsville region of between 40 and 50 per cent does not

explain much as to coke. Applied to the market price of Connellsville furnace coke for spot shipment, which averaged about \$3 in January and February, even a 50 per cent change would only make \$4.50 coke. The disorganization in the market and the loss in efficiency add much to the price.

It is entirely unfair, moreover, both to coke producers and to furnacemen, to take prices ruling in the market early in the year as pivotal or basic. The coke producer was losing money and the furnaceman was losing money. The latter had written down his ore pile and was still dealing in red ink figures in monthly operations. In so changeable an industry, losses must sometimes be taken, but the taking of losses cannot be prolonged indefinitely. It is a habit that cannot become confirmed.

While the pig iron market now presents an appearance of equalization in that some buyers have been taking hold for forward delivery, it does not follow that prices are stabilized. Many buyers hope to buy at somewhat lower prices later and average their purchases down, while the sellers hope to sell at higher prices and average up. Were there to be stable conditions in coal and coke the liquidation in coke prices could not be considered complete; but on the other hand the possibility of another strike next April begins to loom and is already being considered by both buyers and sellers of pig iron. While we have made progress in various respects we have not yet entered a period of stability.

## The Change in Labor Turnover

It has been estimated that for each new man employed to take the place of another in shop work the money loss is somewhere between \$40 and \$200. Decreased production while the newcomer is being trained, spoiled work, machinery operating below accustomed capacity, and other considerations enter into the case. Even a highly skilled workman must become used to a new task and environment before he can reach his full efficiency.

To-day labor turnover is at a low point, according to the records of firms that follow the item closely. The experience of one large plant which



manufactures textile machinery is probably typical. Perhaps the showing in this case is the more impressive because the firm did not feel the business depression very seriously, owing to the peculiarities of conditions in its own market.

The records show that in 1918, at the peak of war production, the labor turnover was 168 per cent. This means that in order to maintain a given working force the names of 268 men were on the payroll in the period of 12 months for each 100 men required in operating the works. Men came and went in relatively rapid succession. This was but natural, because the draft was working, and there was a restlessness of labor, which characterized the war period.

In 1920, with business still at highest pitch, the percentage of turnover had reduced to 143 per cent, which was still abnormally high, though the army and navy had demobilized, and men were back in industrial employment. Ultra-prosperity of labor continued to breed restlessness.

At present labor turnover in these works is only 27 per cent. The figure is the more extraordinary at this time, because the company has been increasing its working force for months past, probably doubling the number of people on its payroll in the last half year, and it is a well-accepted fact that the greater the number of men hired the greater the per cent of turnover.

The change for the better is not difficult to explain. A great many workers have felt the pinch of unemployment, and are glad of the opportunity to work at a good job without hunting about for something they think may be better. No one connected with industry who went through the years immediately preceding the great slump is likely to forget the ceaseless shopping around of workers, from shop to shop and city to city, following the will-o'-the-wisp of higher wages. When the break came these drifters were first to feel its hurt, for, taking them as a whole, they were the first to go, as working forces were decreased. Owners tried in every way to keep their tried and true men at work, at least part of the time. But toward these others they felt small sense of responsibility.

Thousands of men learned a lesson from experience, and probably it will be a long time before it is forgotten. The result should be a lower turnover. As the period of good business goes along, the per cent will increase to a certain extent, especially in the face of labor shortage. But those who have given the matter closest scrutiny agree it will end in a moderate figure compared with that of the last good times.

Reckoned in money, turnover is a formidable thing. Taking the case of the textile machinery firm, reckoning cost per man at the average figure of \$125, when the firm was on a 143 per cent basis it was losing annually \$17,875 for each 100 men of its established force. To-day, on a 27 per cent basis, it is losing \$3,375.

Patent litigation frequently has been a serious deterrent to the introduction of a new process which has unquestioned merit. Improvements to old processes have often been delayed or rejected for the same cause. The announcement is gratifying,

therefore, that the various conflicting patent interests, involving the blow-torch and similar improvements to open-hearth furnaces, have pooled their aims in one company. Actual improvements in open-hearth efficiency, particularly as regards combustion economy—more than ever a vital matter to-day—had been few for many years. Just when the marked benefits resulting from the Egler, McKune and Venturi types of furnaces seemed likely to be postponed by conflicting patent litigation, this co-operative movement has been perfected. Already it has been demonstrated that the output of a furnace can be increased 20 per cent and the fuel consumption decreased 10 per cent. The co-operation of the various interests is also resulting in further improvements to existing types of furnaces.

### An Important Manganese Steel

Considerable study has been given of late to a steel which has been known for some time but without full advantage being taken of its excellent qualities, if indeed they have been really appreciated. It is a manganese steel containing about 1.25 per cent manganese and having a low to medium carbon range. It should be classed as one of the simplest alloy steels, possibly the simplest of all.

Two important articles on the properties and advantages of such steel have appeared recently in *THE IRON AGE*. In the issue of Sept. 28, under the title "Pearlitic and Sorbitic Manganese Steels," the author strongly urges the value of a higher manganese content in both steel castings and rolled material and the striking properties these have shown after proper heat treatment. In *THE IRON AGE* of Nov. 23 a discussion of "The Effect of Manganese on Carbon Steels" by two members of the staff of the Bureau of Standards brings out the beneficial effect of increased percentages of manganese on the structure of steel, particularly in adding to the strength of low and medium carbon steels. The authors clearly confirm some general impressions. An important fact is that in normalized steel of this composition the higher manganese content causes a pronounced decrease in grain size resulting in greater strength.

This testimony of the late Dr. Henry M. Howe before the American Society for Testing Materials in 1917 has had specific confirmation in the work done more recently:

The retarding effect of manganese on structural changes shows itself by leading in general to finer structure, \* \* \* This greater fineness leads to better quality in general and to a higher elastic limit in particular, though of course with a corresponding sacrifice of ductility. The great value of manganese for this purpose has not begun to receive the attention it deserves.

A conspicuous use of steel of above 1 per cent manganese content was for cast steel anchor chain during the war. It has been employed also for couplers and in a number of cases it has given great strength and toughness to special forgings and rolled material.

For some time an extensive investigation has been carried on with large forgings. A railroad

company has under way a series of tests as to its availability for rails, and such rails have proved quite satisfactory in actual service.

### Lower Labor Cost in Britain

The British Ministry of Labor has issued a report which reveals marked reductions in wages, especially in labor entering into exports. Iron and steel are particularly affected, and comparisons with wage costs in the United States afford food for reflection.

The report contains a table comparing wages in the leading industries of the country on Dec. 31, 1920, and Sept. 30, 1922, a period of 21 months beginning with labor at the peak. Each figure is the percentage increase over pre-war rates. The average decrease in wages is large—from 170 per cent above pre-war figures on Dec. 31, 1920, to 75 per cent above on Sept. 30, 1922. This represents a reduction of 35 per cent. But the metal industries have been affected much more than that.

In 1920 the iron miners of the Cleveland district were receiving 200 per cent above pre-war rates; in September last their wages had dropped to 43 per cent above pre-war schedules, a reduction of over 50 per cent. The heavy iron and steel trades, as the classification has it, had been from 50 to 350 per cent above the pre-war basis. On Sept. 30 they were 20 to 100 per cent above. Tin plate and sheet steel trades ranged from 150 to 231 per cent, they are now 34 per cent, above the high level.

In the engineering trades, fitters and turners dropped from 130 per cent above pre-war to 48 per cent, and iron molders from 125 to 44 per cent. Lesser cuts were made in the building trades, agricultural labor, railroad labor and other classes. Shipyard workers have been reduced 35 per cent.

Coal miners have suffered a deep cut. They were getting from 185 to 190 per cent over pre-war rates, now they are getting only 20 to 40 per cent. All these figures are based on a full working day.

These changes downward appeal to British economists as "an important factor contributing to the more effective competition of British trades in foreign markets," to quote a report of Barclay's Bank, Ltd. It is also deduced that the lower wage and the resulting greater volume of business have contributed much to the reduction of 500,000 in the number of unemployed since January. The increase in British iron and steel exports meanwhile has been significant.

The final adjustment of British wages has not been reached. In this respect the condition is parallel to that existing in the United States, where the farmer has ground for complaining because it takes nearly an acre of wheat to buy a day's work of a plasterer or bricklayer. The comments of the British economist are quite in line with much that has been said on the same subject on this side:

There is considerable disparity between the relative increases (the per cent above pre-war rates) not only in different industries, but also among the various classes of workers within those industries, while the wages again vary in different districts. Certain adjustments in the relative pre-war wages received by different workers were undoubtedly necessary, but it is evident that many inequalities still exist. In some cases the increases in full time weekly rates at the end of September, 1922, are equivalent to little more than 20 per cent above the pre-war rates, while in others as much as 120 or 130 per cent, or even more, is being received.

The particularly arresting fact, from the standpoint of American steel manufacturers, is that while the readjustments in labor cost have resulted in a steady increase in British iron and steel exports, the high costs which persist here are accompanied by exports at the lowest rate in years.

## CORRESPONDENCE

### Life of Galvanized Sheets Depends on Amount of Zinc Coating

*To the Editor:* We have read with great interest the article in your issue of Nov. 16 entitled "Galvanizing at Fault?" Our experience leads us to believe that the stand of G. F. Halfacre and J. A. Singmaster of the New Jersey Zinc Co. is well taken, and we cannot agree with J. A. Aupperle's contention that Messrs. Halfacre and Singmaster overstate conditions.

We have been producing hot galvanized material for use under the exacting conditions existing in the marine field for about 65 years, and for many years we have been insisting that only a heavy coating of zinc would afford protection to iron or steel for long periods of time. We were accordingly much gratified to find our conclusions verified by the research department of the New Jersey Zinc Co. Frequent letters which have come to us from farmers and others along the coast, (to say nothing of conversations with people who were using galvanized sheets and galvanized fence wire) have convinced us that whatever these products were doing in the laboratory, in the field of actual service they were falling down with astonishing rapidity. Every plumber or tinsmith with whom we have talked knows that the galvanized sheets now furnished have a very short life and admits it frankly. We quote below from a couple of letters which we have received within the past two weeks that are typical of many letters bearing upon the same subject. One written at Hawks Park, Florida, Nov. 5, 1922, says:

Do you manufacture galvanized hog fence? If not, kindly tell me where I can get a good quality of such fence.

Here the salt air is much stronger than in Maine. So much so that the galvanized wire which they have here will not last over five years. When I came here in 1915 I bought some second-hand chicken fence. It's just as good now as when I bought it. The other wire I bought in New Smyrna four years ago is all rusted out and gone.

The galvanized goods they sell here are no good. For instance, when I came they had just built a new freight house and covered the roof with galvanized roofing. Now it looks as though it had been used as a target for bullets and shot.

With the old-time sheets lasting from 25 to 30 years on the Isthmus of Panama and in the Philippine Islands under conditions notoriously favorable to corrosion, it looks as if there was something the matter with sheets that break in seven years like those used at Hawks Park, Florida.

The superior durability of the chicken wire in this instance is worth noting, and the reason for it is very simple. This wire is woven first and then galvanized, so that it takes on the heavy coating of zinc upon which durability depends, and we do not believe that a superior base in the case of the hog wire and galvanized sheets would offset their lack of zinc coating due to wiping down.

Another farmer writing from Wethersfield, Conn., to find where he could secure our hot galvanized nails concluded his letter as follows:

I am so disgusted with galvanized steel fencing and such galvanized steel nails as we have used that I cannot express myself.

We have received numerous requests from farmers to galvanize their rusting fence wire. The writer is to-day replacing portions of the galvanized gutters and leaders on his home after only five years of service. The next time these gutters and leaders are replaced they will be formed from the self colored iron or steel



sheets and then galvanized by the hot process. With a heavy coat of zinc, we feel confident that they will outlast the old light-coated ones five to one, and that regardless of the quality of the base.

We might cite much more evidence from the field of actual service to support the stand of Messrs. Halfacre and Singmaster, but space and time are limited. If (as Mr. Aupperle remarks) it is a fact that galvanized gutter and leader pipes made from pure iron are giving good service under many different kinds of atmospheric conditions in this and foreign countries, there are thousands of consumers who would like to know where they can get such material.

So far as those classes of material which must be formed after galvanizing are concerned, we do not believe that anything like maximum durability can be attained. If the zinc coating is heavy enough to afford maximum protection, it will flake off when the sheet is formed, and if there isn't enough zinc to flake when the sheet is bent, you can be very sure that there is not enough zinc coating to protect the material for any length of time—and this irrespective of the base. Some bases are doubtless more durable than others, but they will all rust rapidly unless protected with zinc, or why is it necessary to galvanize them at all?

In our opinion too much stress has been laid on the importance of the base so far as it influences durability. It is doubtless an important factor in the forming operations referred to by Mr. Aupperle, but "in a well galvanized sheet the iron base is rarely brought to test under weather exposure until after many years of service. Speller found that the base of galvanized roofing taken from Panama, which had seen service for over 25 years and was still in good condition, proved to be steel, but a larger proportion is wrought iron and often of inferior quality." It is not the base but a heavy zinc coating that prevents rust.

We suggest that those who are interested in this subject secure a copy of research bulletin entitled "The Value of Heavy Galvanizing as Demonstrated by Actual Use," issued by the New Jersey Zinc Co., New York. This bulletin is by far the best thing we have ever seen on the subject. As a result of their investigations they point out that both old and modern sheets showed the presence of chlorides—that the lead and iron content of the zinc coating in both the old and new sheets was practically the same when calculated on the basis of the speller used. But in spite of these similarities the new light-coated sheets were breaking down in the Philippines in from two to five years, whereas the old heavy coated sheets were still good after 25 to 30 years. They logically conclude that only the difference in the weight of the zinc coating will account for the difference in term of service, and we believe they are absolutely right.

These conclusions are borne out by other investigators. For instance, Van Gundy noted that galvanized plate which had seen service of 20 or 25 years in Panama was better than modern plate which had been in service less than two years, and he makes this startling statement: "Yet, even after this service, I found that it had three times as much zinc on it as the American manufacturers put on their plate, even the best in the market." See Proceedings American Society for Testing Materials, 1909, p. 441.

Another investigator sums up the results of his work on fence wire as follows:

In every instance where a very durable fence was found the coating of zinc was relatively very thick; while, on the other hand, the fences which showed marked corrosion in from one to two years proved to have almost no zinc on the iron, the zinc color being due to a layer of alloy alone.

We repeat that the durability of galvanized material depends principally upon the thickness and even distribution of the zinc coating. The purity of the coating and the purity of the base are minor considerations which can be ignored provided a thick coating of zinc is properly applied. The question we are asked frequently is not why the base does not last, but why the zinc coating doesn't. The reason as a rule is that there never was enough zinc used.

We have great respect for scientific research, but we feel that in some cases at least it requires a judicious

mixture of "horse sense." Every one who has been in touch with the process of zinc coating for the past 20 years can recall the highly technical articles which appeared in advocacy of electro-galvanizing and sherardizing some years ago. The details and terms were Greek to the average reader, but the general impression created by these articles was that the only thing for the hot galvanizers to do was to shut down their trusty old kettles and install one of the new processes.

Our Mr. E. S. Mowry pointed out the weakness of the new methods in the columns of THE IRON AGE of Jan. 25, 1906, and time has shown that Mr. Mowry and not the research workers was right. To-day it is admitted that sherardizing and electro-galvanizing have their uses, but no engineer who knows his business would recommend them for use where extreme durability is required. The new methods failed on the score of durability because they lacked sufficient zinc coating, and a thin coating of zinc applied by the hot process will fail just the same, regardless of the quality of the base or purity of the coating.

WILBUR J. ROBINSON,

Wilcox, Crittenden & Co., Inc.

Middletown, Conn., Dec. 7, 1922.

### Federated Chamber for Near East

A dinner will be held Dec. 15 at the Hotel Commodore, New York, by the Federated American Chambers of Commerce of the Near East, 29 Broadway, New York. The speakers are Oscar S. Straus, former Ambassador to Turkey; Dr. S. Panaretoff, Bulgarian Minister at Washington; Thomas Whitemore, explorer, and L. I. Thomas, president of the Federated American Chambers of Commerce of the Near East.

The federation was recently organized to correlate the efforts of the American Chambers of Commerce at Constantinople, Athens and Alexandria. The president is Lucien Irving Thomas, Standard Oil Co. of New York; the vice-president is J. F. Lucey, of the Lucey Mfg. Corporation; the treasurer is Neal Dow Becker, of the Hammond Typewriter Co.; and the secretary is E. E. Pratt, formerly chief of the Bureau of Foreign and Domestic Commerce of the Department of Commerce. Among the directors is A. A. Holliday, Jones & Laughlin Steel Co., Pittsburgh, and the life members include Cleveland H. Dodge, Phelps-Dodge Co.; James A. Farrell, president United States Steel Corporation; C. H. Minor, International Western Electric Co., and A. B. Farquhar, A. B. Farquhar Co., York, Pa.

### Carpenter Steel Co. Denies Merger

The Carpenter Steel Co., Reading, Pa., has announced that statements made in the newspapers and circulated throughout the country for several months reporting the merger or sale of the Carpenter Steel Co. to other interests are erroneous. No such negotiations are pending, says President F. A. Bigelow, and no change from the present ownership and management is contemplated.

### Detroit Scrap Market

DETROIT, Dec. 12.—Prices on all scrap materials are approximately the same as those quoted a week ago. The majority of the melters in this district have covered for their first quarter requirements on pig iron and are anticipating a normal differential on their scrap requirements.

The following prices are on a gross ton basis, f.o.b. cars producers' yards, excepting stove plate, automobile and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel.....	\$14.50 to 15.50
Shoveling steel .....	15.00 to 16.00
No. 1 machinery cast.....	19.00 to 21.00
Cast borings .....	12.00 to 13.50
Automobile cast scrap.....	21.00 to 23.00
Stove plate .....	16.50 to 18.00
Hydraulic compressed .....	14.50 to 15.50
Turnings .....	11.50 to 12.50

## EXPORT MARKET QUIET

### Japanese Rail Inquiries Still Heavy—South Manchuria Rails May Go to Germany—Renewed Interest in Foreign Iron

NEW YORK, Dec. 12.—With the exception of purchases of rails by Japan, which include tonnages of light, medium and heavy sections, the export market is quiet. The little Japanese business now appearing in bars, sheets and similar material is evidently being placed in Great Britain or on the Continent. In tin plate, however, one Japanese export house in New York recently booked an order for 1900 base boxes of charcoal tin plate for a canning factory.

Among current rail inquiries is one for a tonnage of 23 miles of 20-lb. sections (723 gross tons). On the bids recently opened by the South Manchuria Railway Co. on 85 miles of 100-lb. rails and accessories including splice bars, bolts, nuts and spikes, the average price per ton on the rails and accessories quoted by an American seller was \$44.63 per ton, c.i.f. Dairen, compared with \$45.16 per ton, c.i.f., the average price per ton submitted by a British seller. On the rails alone there was a difference of only 4c. per ton between the American quotation of \$43.50 and the British price of \$43.54. Although early delivery was offered by both the American and British mills, it is believed that the

tonnage will be awarded on a German bid, which is said to have been about \$8 per ton less, as the terms of delivery specified by the buyer were 40 miles at Dairen in May and the remaining 45 miles to be delivered in July. It is believed that these terms will permit the Germans to obtain the business.

There has been some inquiry recently for structural material from Japan, but seldom for tonnages of any size, being as a rule confined to 100 or 200 tons. The present quietness in the Japanese market is attributed by some Japanese exporters to the money stringency caused by the custom of settling all accounts carried by business houses before the beginning of the new year. Consequently, a slight renewal of activity is expected after Jan. 1.

An importer of Scotch iron states that the recent dullness in sales of imported iron has been broken in the past ten days by considerable inquiry from foundries in the New England district. Most of these inquiries are for prices on fairly high grade Scotch foundry iron and range from 100 to 500 tons, although one or two being handled by this importer are for 1000 tons or more. This importer also reports an interest among these foundries in lower grades, which should be available at \$20 to \$21 per ton, c.i.f. Atlantic port. At present Scotch foundry iron analyzing 2.25 to 2.75 per cent sil. with phos. at 0.2 to 0.3 per cent can be brought in at \$27.25 per ton, c.i.f. Atlantic port, duty paid, and on a large firm offer this price could probably be shaded.

## UNCERTAIN FRENCH MARKET

### Producers Shy at Extending Contracts — Coke Shortage Restricts Pig Iron Stocks — Prices Fairly Firm

PARIS, FRANCE, Nov. 24.—The recent fluctuations in the rates of exchange have brought about a state of uncertainty in the French iron and steel trade which makes sellers and purchasers shy of binding themselves beyond the end of this year. The same uncertainty is also, to some extent, restricting export transactions.

Owing to the lack of coke, French pig iron production is no longer increasing.

In October, Germany delivered to French blast furnaces 355,000 tons of reparations coke, plus about 30,000 tons to foundries. From Nov. 1 to Nov. 19, deliveries to French blast furnaces totaled 219,000 metric tons. The rate of delivery was about the same as in October. The slacking off in deliveries which occurred the first four days of November, causing the blowing out of a few blast furnaces in Lorraine, is worthy of note. The quantum of coke due to France in October was 410,000 tons (including supplies to foundrymen).

The coke resources of France are:

1—The production from ovens annexed to French collieries, which averaged 79,700 tons per month during the first nine months of 1922 (against a pre-war monthly production of 220,000 tons).

2—The production of ovens annexed to French iron works, averaging 106,000 tons per month during the first half-year of 1922.

3—Imported coke (68,000 tons in October), mostly from Belgium, and which is not all metallurgical coke.

Belgium, which is in great need of coke, will only be able to deliver a small quantity of coke this month and, as French requirements, on the basis of the present pig iron production, may be estimated at 650,000 tons, a shortage of about 100,000 tons had to be reckoned with this month. In order to alleviate this situation, the Société des Cokes de Hauts-Fourneaux purchased 20,000 tons in Great Britain.

The restarting of a few coke oven batteries in the North of France, which had been destroyed during the war, is announced for next month, but this new supply will be readily absorbed by furnaces soon to be put into blast in the same district.

The adjusted price at the Franco-German frontier of German reparations coke has been maintained for December at 95 fr., but it will be very likely raised to 97 fr. for January delivery.

**Iron Ore.**—French production of iron ore in September amounted to 2,064,314 tons, with stocks at the end of that month aggregating 3,234,386 tons. France has exported the following tonnages of iron ore:

	September, Metric Tons	First Nine Months, Metric Tons
Germany .....	130,811	1,541,842
Belgium .....	594,479	1,635,865
Sarre .....	249,838	1,955,072
Netherlands .....	6,451	172,089
Other countries .....	237,195	1,504,675
Total .....	1,218,774	6,809,543

**Pig Iron.**—Available supplies of foundry iron are scarce, both for November and December delivery, and French producers refrain generally from binding themselves to any fixed date of delivery. The present average price of chill-cast foundry pig iron P. L. No. 3, is 240 to 250 fr. The export price, f.o.b. Antwerp (Belgian currency), is 260 to 270 fr. The production of French hematite is almost entirely absorbed by the home market and very little of it is being exported. Producers have raised their prices, which are now as follows, at furnaces:

	Fr.
North .....	310 to 320
East .....	320 to 330
Center .....	280 to 300

Some hematite pig iron, produced in the electric furnace and analyzing less than 2 per cent silicon and more than 3 per cent carbon, is being offered at 260 fr. at works in the center of France.

**Semi-Finished Steel.**—A feeling of uncertainty pervades this market, and works decline to quote for delivery beyond the end of December. A few parcels were sold to Great Britain, but for prompt delivery. On the other hand, Germany is still taking substantial tonnages. Present average prices for basic steel on the home market are:

	Fr.
Ingots .....	310
Blooms .....	330 to 340
Slabs and billets .....	350 to 360
Sheet billets .....	385 to 395

About 20 fr. per ton should be added for open-hearth steel. Export prices, f.o.b. Antwerp (Belgian currency), are: Ingots, 330 fr.; blooms, 350 to 360 fr.; billets, 370 to 380 fr.; sheet billets, 400 to 420 fr.

**Beams and Rails.**—The demand for beams has seasonally slackened off. At its meeting of Nov. 18 the Comptoir Sidérurgique, which recently had slightly altered its selling conditions to the detriment of purchasers, decided to maintain them so modified, and to maintain also its base price of 475 fr. per ton. The large order of rails for the French railroads is still being



considered and will probably be shortly allocated to French producers exclusively. The infringement by the Société des Hauts-Fourneaux de la Chiers, which is a branch of the Belgian Société d'Ougrée-Marihay, of the articles of association of the Comptoir Siderurgique (controlling the home sales of beams and rails) has caused a sensation, and the dissolution of the Comptoir Siderurgique had even been contemplated. It is reported, however, that at the meeting of the comptoir, on Nov. 18, it was decided to let matters stand as they are. Export prices, f.o.b. Antwerp (Belgian currency), are:

	Fr.
Beams .....	380 to 390
Heavy rails .....	420 to 425
Light rails .....	400 to 410

**Plates and Sheets.**—Actuated by the satisfactory situation of the French sheet market (orders taken in October aggregated 65,000 tons, about the same tonnage as in September), and, also, by the rise of the pound sterling and a recent increase in the price of Belgian sheets, the Comptoir des Tôles et Larges Plats decided, at its meeting of Nov. 17, to raise to 630 fr. the base

price of flats, an increase of 20 fr. per ton. The other base prices, delivered at average destinations remain unchanged as follows:

	Fr.
Heavy sheets .....	650
Medium sheets .....	730
Light sheets .....	930

**Export prices, f.o.b. Antwerp (Belgian currency) are:** Heavy sheets, 470 to 480 fr. for basic steel and 520 to 530 fr. for open-hearth; flats, 450 to 460 fr. and 470 to 480 fr. for basic and open-hearth respectively.

**Rolled Merchant Products.**—The market is now inactive. Delays of delivery do not exceed 6 to 10 weeks for average specifications. The present price is 430 to 450 fr. at producers' works in Lorraine. The export price, f.o.b. Antwerp (Belgian currency), is: 425 to 430 fr.

**Castings.**—The situation in castings is uneven. Some works are well filled with orders and complain only of a lack of skilled labor, while others have no orders on hand. Prices, also, vary considerably according to districts and makers.

## GERMAN STEEL PRICES JUMP

**Pig Iron Advance Is Slight, But Steel Is Up 21 Per Cent on Average**  
(By Radiogram)

**WILMERSDORF, BERLIN, GERMANY, Dec. 12.**—Foundry iron No. 1 has been advanced from 156,665 m. per metric ton (last week) to 159,390 m. (\$20.24 per gross ton, at 1¼c. per 100 m.). Steel ingots have gone up from 177,800 m. to 214,300 m. (\$27.21); steel bars, from 243,300 m. to 293,200 m. (1.66c. per lb.); thin steel sheets, from 373,600 m. to 450,300 m. (2.55c. per lb.)

[Compared with two weeks ago, foundry iron has advanced 48 per cent, from 107,765 m.; steel ingots, 33 per cent, from 161,600 m.; bars, 34 per cent, from 219,200 m.; thin sheets, 36 per cent, from 332,000 m.]

**German "Prosperity" Increases Despite Decline of the Mark**

**BERLIN, GERMANY, Nov. 25.**—According to official theory, the iron and steel industry is under the injurious influence of the currency depreciation, and is threatened with ruin. In practice, there is no sign of this; the currency depreciation indeed involves a corresponding price rise; but the substance of the industry, that is, its production and its sales, remains practically unaffected. The last Prussian trade ministry monthly report declares that, despite pessimists, no crisis is in sight, or is even possible. Privy Councillor Kloeckner, head of the big Kloeckner company, states that his companies have orders until late spring.

While some minor works temporarily reduced output when the mark decline began, the sole reason, as Kloeckner shows, was shortage of working capital, not shortage of orders. The large concerns did not suffer and the small companies have now replenished their working capital by the customary credit and inflation process.

During the time when the mark declined, some German manufacturers and traders raised prices practically without any restrictions, in some cases even in excess of the actual inflation of the currency, and producers of raw material have sometimes been accused of increasing the economic difficulties of the country by their price policy. While in some industries prices are still going up because of higher wages and increased cost of raw materials, the Steel Syndicate decided at its last meeting not to raise the prices of rolled material. The recent improvement in the exchange would warrant a reduction in prices, but the combine claims that other factors of production have increased. The Pig Iron Association has however reduced some of its prices for

the first time since early in 1921. The following table shows the decreased price in marks per metric ton:

	Marks per Metric Ton	
	Nov. 26	Nov. 16
Hematite .....	130,829	143,365
Foundry iron No. 1 .....	107,765	110,173
Foundry iron No. 3 .....	107,695	110,103
Foundry iron, Luxemburg quality .....	102,993	105,465
Steel-making iron, low in copper .....	130,161	142,697
Siegerland steel-making iron .....	102,034	102,034
Spiegeleisen, 8 to 10 per cent. ....	110,994	110,994
Malleable pig iron .....	128,469	141,005
Ferrosilicon, 10 per cent. ....	152,478	165,014

The foreign trade reports for the first nine months of 1922 again show the remarkable extent to which Germany has become an importer of cheap heavy iron and steel products for the purpose of manufacturing and exporting high-priced finished goods. In pig and bar iron, two former export specialties, Germany is now predominantly an importer:

	First Nine Months of 1922	
	Imports, Metric Tons	Exports, Metric Tons
Pig iron .....	192,115	110,411
Scrap .....	437,223	44,603
Ingots, billets, slabs, blooms, etc. ....	199,408	54,621
Bars, girders, bands .....	535,701	379,341
Sheets .....	56,447	173,857
Wire .....	7,963	100,669
Rails, ties, etc. ....	76,595	251,934
Bridges and parts .....	1,264	39,789
Farm machinery .....	1,028	29,057
Tools, etc. ....	540	31,028
Screws, rivets, horseshoes, etc. ....	4,718	22,612
Railroad springs, other car springs .....	471	5,153
Axles .....	153	2,405
Steel bottles, milk cans, etc. ....	2,478	82,300
Boilers .....	1,897	24,661
Machines .....	8,065	339,157

Before the war Germany was a great exporter of finished steel and iron goods and machines, but was also a great exporter of heavy and semi-finished steel and iron. The shortage of the latter, due to the loss of Alsace-Lorraine, has merely had the effect of making her an importer, and the result is that other iron-producing nations are doing Germany's rougher, less profitable work. By this is supplied an explanation of the fact that Germany while not having sufficient heavy materials has almost no unemployment.

The new Otto Wolff syndicate has enormously extended its already big sphere by coming to an agreement with the General Electricity Co. (A. E. G.) which under the two Rathenaus became Europe's greatest producer of electrotechnical wares. Otto Wolff and the director of the Phoenix Corporation, also a Wolff concern, have been elected members of the A. E. G.'s control board. The Wolff group came into relations with the A. E. G. in August, 1921, when both concerns and also Krupp's took up shares in the Rhenish Steel Corporation, which is now a dependent of Wolff. The A. E. G. has already wide ramifications, including the important Deutsch Werft Co. of Hamburg, the Gutehoffnung Smelting Corporation (Haniel concern), and the Linke-Hoffmann machinery concern. The Wolff combination now closely resembles Stinnes' Electro-

Metal Concern, but it is less closely fused. The A. E. G. has decided to increase its capital from 1,100,000,000 to 1,400,000,000 marks, which at present exchange is only \$200,000, and a mere fraction of the value of the corporation's assets. The Rhenish Steel Works reports unsatisfactory per capita productivity of its employees,

and ascribes its increasing output solely to new plant and methods; but *Die Wirtschaftskurve* published by the *Frankfurter Zeitung* in the November issue gives further details showing that the individual efficiency of workmen is rapidly increasing, and in many industries is already higher than before the war.

## BELGIAN MARKET QUIET

### Higher Raw Materials—Checking Forward Selling—Slight Increase in Pig Iron Output

BRUSSELS, BELGIUM, Nov. 29.—With the fluctuations in exchange rates (15.65 fr. to the dollar Nov. 29 in Brussels) the tendency of the Belgian iron and steel market is uncertain. The present shortage of coke supplies and the probability of a rise of 15 fr. per ton, effective Jan. 1, are adding to the general reluctance of Belgian mills to book orders for forward delivery. Six blast furnaces have been temporarily blown out. However, the present situation of the trade cannot be considered bad; prices have firmed up and show a rising tendency.

**Pig Iron.**—Available supplies are scarce and prices have been rising. A few transactions were recently concluded at 250 fr. for basic pig iron and 290 fr. for chill-cast foundry iron, No. 3 P. L. Antwerp, Luxembourg and Lorraine furnaces are quoting foundry iron at 285 to 290 fr. f.o.b.

**Semi-Finished Material.**—Notwithstanding a good demand from Great Britain, which is only partly met, this market is rather inactive. Present prices on basic material are.\*

	Delivered in Belgium	Lorraine and Luxembourg Products, f.o.b. Antwerp
	Fr.	Fr.
Ingots .....	325	320
Blooms .....	350	355 to 360
Billets .....	370	375
Sheet billets .....	400	400 to 410

\*Supplement for open-hearth steel: 20 to 30 fr.

**Rolled Products.**—The demand for iron products is satisfactory, and prices are rising.

For export f.o.b. Antwerp, prices are slightly lower than the domestic market. Bolt making iron is quoted at 490 fr.; screw stock at 635 fr. and forge iron at 490 fr. for domestic delivery.

The market for rolled steel products is quiet, especially for export. Producers are, in many cases, refraining from accepting orders, which makes it com-

paratively easy to maintain prices by means of a few domestic orders.

Inquiry for angles and rods is particularly active, as well as for small sections.

Domestic prices are as follows:

Bars .....	Fr.
Rails .....	470
Beams, large .....	490
Beams, small .....	410
Rods .....	425
	560

For export, prices f.o.b. Antwerp, notably for Lorraine products, are slightly lower.

**Sheets and Plates.**—Sheet mills are generally well filled with orders. Medium gage sheets are particularly active.

The following prices are being quoted:

Heavy .....	Fr.
Medium .....	490
Light, 1½ to 1 mm. ....	510
Light, 0.5 mm. ....	650 to 825
	950 to 1000

### Argentina Buys Belgian Rails

On its total requirement of 100,000 tons of rails, the government of the Argentine Republic has so far allocated 30,000 tons, to the Société de Sambre-et-Moselle. The remaining tonnage will soon be re-advertised for tenders.

The Providence iron works, at Marchienne-au-Pont, has received from Bulgaria an order for 250 tons of beams and 50 tons of concrete iron on a bid that was about 7 per cent below the German prices.

### Pig Iron Production Increases in October

Production of pig iron in October showed an increase over September of 11,570 metric tons and the October ingot production was 176,420 metric tons compared with 163,890 metric tons in September. The average monthly production of pig iron in 1921 was 73,032 metric tons, compared with 207,058 metric tons monthly average in 1913 and the ingot production averaged 60,625 metric tons last year, compared with 200,398 metric tons in 1913.

#### October Production

	Number of Furnaces in Blast	Pig Iron, Metric Tons
September, 1922 .....	32	163,120
October, 1922 .....	33	174,690

## LUXEMBURG MARKET FIRM

### Blast Furnace Operation 63 Per Cent—Exports Active, But Decline of Mark Curtails Ore Sales

PARIS, FRANCE, Nov. 26.—Activity in iron and steel in the Grand Duchy of Luxembourg during the last few months has been quite satisfactory. Of the 47 furnaces in the country 30 are now in blast, distributed as follows between the various concerns:

Works	Total Furnaces	Number in Blast
Acieries Reunies de Burbach- Eich-Dudelange .....	15	13
Terres-Rouges .....	11	6
Hauts-Fourneaux et Acieries de Differdange et St. Ingbert...	13	6
Rodange .....	5	3
Steinfort .....	3	2

Several plants are working at full capacity. The Luxembourg industry is therefore in a better situation than either the French or the Belgian trade, and this may be explained by the fact that, while using its own ore, the Grand Duchy is exclusively an iron exporting country situated in close proximity to Antwerp and, especially, to Germany, the latter country being always ready to absorb important tonnages of pig iron and semi-finished material from Luxembourg.

In October Luxembourg produced a total of 165,182

metric tons of foundry, Bessemer and open-hearth furnace pig iron, compared with 151,813 metric tons in September, while the production in October of basic, open-hearth and electric furnace steel was 139,002 metric tons, compared with 134,690 metric tons in September.

**Iron Ore.**—In 1913 the iron mines situated in the Grand Duchy produced 7,331,000 metric tons of ore. In 1921 the production fell off to 3,031,000 tons. It materially increased this year and is averaging 350,000 to 400,000 tons per month, from which it may be inferred that the year's output will be about 4,500,000 tons.

The Luxembourg iron mines may be divided into three classes:

1. The mines belonging to iron work situated in the Grand Duchy. They were well occupied during the greater part of this year and the output of some of them is even reaching the pre-war level.

2. Those belonging to iron works situated outside the Grand Duchy. The production of these mines has been irregular and is proportionate to the activity of the owning concerns.

3. Those belonging to private individuals. These mines are meeting with some difficulties, as consumers are more exacting in their demands for quality of their ore, and the collapse of the mark is now interfering with shipments to Germany.

The following are the prices at mines (Belgian cur-



rency), quoted in October, 1922, by the iron mines which are selling ore: Calcareous ore, 29 to 30 per cent of iron, 9.50 fr. per ton; siliceous ore, 35 per cent of iron, 9 fr. per ton.

**Foundry iron.**—Chill-cast foundry iron, No. 3 P. L., is now about 270 fr. (Belgian currency), f.o.b. Antwerp.

**Semi-Finished Material.**—Present prices on basic material, f.o.b. Antwerp (Belgian currency), are: Billets, 365 to 370 fr.; sheet billets, 385 to 390 fr.

**Rolled Products.**—The demand for beams and merchant products is important, and hoop and strip steel as well as rods, are particularly animated. Luxemburg produces but a small tonnage of sheets and is therefore not much affected by present conditions in that material.

Present prices, f.o.b. Antwerp (Belgian currency), are:

	Fr.
Beams .....	410 to 420
Rolled merchant products .....	460
Rods .....	550
Hoops .....	600

#### Prospects Are Favorable

The prospects of the iron and steel trade in Luxemburg are favorable. It should, however, be observed that the margin of profit is small and was recently influenced by the rise in the price of coke and by the introduction of a tax on transactions.

Although Luxemburg producers do not feel any real anxiety about their labor supply, a certain lack of foreign labor, especially skilled workmen, is noted. There are also complaints about the insufficiency of coke supplies.

Large inquiries for rails are being handled by Luxemburg concerns, which are quite hopeful of securing a part of them.

## WHEELING PLANTS BUSY

### Riverside Works National Tube Co. Practically Full—Furnace Lighted

WHEELING, W. VA., Dec. 11—The most interesting development of the past week among steel plants in this district was the lighting of the second blast furnace at the Riverside works, National Tube Co., Benwood. With full pig iron production, that plant is rapidly getting back to normal activities in the other departments. Three of the five butt weld furnaces are in operation and the two remaining ones will go on late this week. There are two lap weld furnaces at this plant, but it is doubtful whether they will go into operation immediately. Steel works and skelp mills, now on day turn, will run day and night turns starting on Wednesday or Thursday. LaBelle plant of the American Sheet & Tin Plate Co. remains down, but other local units of this and other subsidiaries of the Steel Corporation are running at a high rate. Another blast furnace, making three in all, at Mingo, Ohio, works, Carnegie Steel Co., was blown in last week. Wheeling Steel Corporation plants are operating on an average of 80 per cent of capacity. This week's schedule follows:

#### Wheeling Steel Corporation:

Wheeling Steel & Iron Co., Benwood plant 65 per cent; Belmont plant, 100 per cent; Top Mill furnace, idle; Martins Ferry furnace in blast; Yorkville plant operating 50 per cent.

Whitaker-Glessner Co., Wheeling mills, 75 per cent; Martins Ferry mills, 85 per cent; Beech Bottom plant, 75 per cent; Portsmouth plant, 95 per cent.

LaBelle Iron Works, Steubenville plant, 75 per cent; Wheeling plant, 95 per cent.

#### United States Steel Corporation:

National Tube Co., Riverside plant, Benwood, practically full.

American Sheet & Tin Plate Co., Laughlin Plant, Martins Ferry, 87 per cent; LaBelle plant, Wheeling, idle; Aetna Standard, Bridgeport, Ohio, 100 per cent.

Carnegie Steel Co., Bellaire plant, idle; Mingo Junction blast furnaces, three or four in blast; bar mills, 100 per cent.

## JONES & LAUGHLIN EARNINGS

### Statement for First Time Makes Public Important Facts—Stock Offered

Earnings of the Jones & Laughlin Steel Co., over a period of 10 years, form an interesting feature of the public offering through Pittsburgh and New York bankers of \$14,000,000 of cumulative 7 per cent preferred stock of the Jones & Laughlin Steel Corporation, as the company now is to be known, as a result of the reorganization and recapitalization of the company. The company, since its inception until the recent proposed change in capital and name, was announced as a close corporation and made no public statement of earnings. The earnings from 1913 to 1923, inclusive, those for 1923 being partly estimated, have been as follows:

Years Ended Dec. 31	Net Sales	Depreciation, Depletion and Amortization	Net Earnings after Depreciation, Depletion, Amortization, Interest and Taxes
1913.....	\$43,101,196	\$1,420,650	\$5,340,669
1914.....	32,402,076	2,053,890	2,702,631
1915.....	44,431,035	2,054,895	7,267,022
1916.....	77,353,009	3,126,026	20,257,877
1917.....	129,810,539	6,117,696	26,622,033
1918.....	128,923,400	18,179,144	7,294,531
1919.....	103,243,608	6,545,961	17,120,287
1920.....	148,615,441	8,568,559	22,611,085
1921.....	39,930,625	3,682,774	†3,610,037
1922*.....	71,500,000	3,900,000	4,900,000
Total...	\$819,310,929	\$55,649,595	\$110,506,048
Average..	81,931,092	5,564,959	11,050,604

\*December estimated. †Deficit.

The consolidated balance sheet as of Oct. 31, 1922, shows net tangible assets of \$137,200,000, or \$228 per share of preferred stock. Total funded debt was only \$21,700,000. Current assets are \$66,000,000, including \$31,400,000 cash and United States Government obligations.

The statement adds: "Net earnings for the 10 years have averaged 2.6 times the dividend requirement on the \$60,000,000 preferred. During this period, dividends have amounted to \$38,700,000, as compared to \$71,800,000 retained in the business."

According to the transfer agents, the entire \$14,000,000 of preferred stock offered to the public has been subscribed. Jones & Laughlin preferred stock has been listed on the Curb Market.

### Sheet Inquiry More Active—Buying Light

YOUNGSTOWN, Dec. 12.—Sheet prices are largely holding at the levels recently named by the American Sheet & Tin Plate Co., and followed by all Valley independents. Tendencies to cut under the market have received a setback since the sheet bar price announcement. While inquiry for first quarter business is somewhat more active, current buying is limited and mills are curtailing production.

In the black sheet market, competition for tonnages is especially keen, and a number of the smaller mills have been tempted to dip below the 3.35c. minimum in order to fill out their rolling schedules.

Buyers have little difficulty in placing blue annealed tonnages at 2.50c. per lb. Galvanized sheet makers generally complain that the 4.35c. quotation leaves them but little margin, due to the advanced cost of spelter, but no business is being rejected at the market minimum.

The 5c. price on full finished sheets, for No. 22 auto body stock, has been considerably strengthened since the \$36.50 price on sheet bars developed. Some highly finished sheet business has undoubtedly been accepted by independents at 4.85c., or \$3 per ton below the independent market.

# Iron and Steel Markets

## SHIPMENTS STILL HEAVY

### Some Excess of Steel Making Pig Iron in December

#### Better Buying for Implement Works—More Cars for Finished Products

The week has brought greater activity in pig iron at Pittsburgh, with sales of 40,000 tons, a continuance of the high rate of pig iron production throughout the country and a notable reduction in the accumulation of finished steel at Pittsburgh district mills as more cars have become available.

In its decrease of 62,000 tons in November the Steel Corporation's total of unfilled orders indicates what is to be expected also in this last month of the year and in the case of all steel companies with the present remarkable output. As high as 85 per cent of capacity has been reached this week in the Pittsburgh district but there will be some falling off in ingot production in the holiday season and the piling of a corresponding amount of pig iron.

With a net gain of three furnaces in the past week, there are now in blast in the Warren, Ohio, Wheeling, W. Va., and Johnstown, Pa., triangle 99 out of 139 furnaces, or nearly twice as many as at the low point in August.

Manufacturers of wire products and pipe are making little if any gain on their obligations, as demand is still large, but in nearly all other products consumers are well taken care of by deliveries on old and in some cases quite low-priced contracts.

Under such conditions the try-out of prices on quantity buying of plates, shapes and bars is likely to be deferred for several weeks. Meanwhile most mills consider it a 2c. market in spite of the 1.95c. and 1.90c. exceptions. One of the latter was made in the case of 6000 to 8000 tons of plates for the Pennsylvania Railroad, all for delivery this month.

For the first time in two years farm implement manufacturers who buy from Chicago mills report a sufficient improvement in the outlook for farmer buying to warrant increases in their production programs. They are now placing a part of their first quarter requirements in bars and other materials.

In the automobile field some orders are being placed for spring and rim steel, but it is all for January shipment, as is some bar business just taken at Cleveland. There is inequality in prices for concrete reinforcing bars, both East and West.

Some Central Western mills still have a 3.25c. price on black sheets, or \$2 below the recently announced price of the Steel Corporation.

Between 25,000 and 30,000 steel cars are now under more or less active negotiation, the buying of the week amounting to 3000 cars, with fresh inquiries for nearly 8000. Ninety locomotives have been added to the pending business. Chicago district car builders, if all pending business were closed, would have nearly a six months' supply of work.

Fully three-fourths of new fabricated steel

offerings come from the Central West, and the total is about 33,000 tons. Awards approximate 20,000 tons, or up to the volume of recent weeks.

Activity in pig iron shifted the past week to districts in which there had been little buying, particularly Chicago and Pittsburgh, and sellers in nearly all parts of the country have been marking up prices, though they report little done at the new quotations. While nearly all recent contracts were for first quarter, a limited amount for second quarter delivery has been placed, but the price which will prevail for the latter period is uncertain. The latest transactions involved about 40,000 tons of various grades at Pittsburgh and nearly an equal amount at Chicago. Bessemer has declined \$2.50 in the Pittsburgh market and malleable \$1. In the South at least one furnace is selling at \$22.50 and resale iron can still be had at \$22. Apart from the large pipe foundry contracts, the tonnages of important interests reported to have covered in the late movement have not been clearly developed.

British exports of iron and steel in November amounted to 372,332 tons, of which 117,708 tons was pig iron (including ferroalloys). Of the 117,708 tons, 79,070 tons was sent to the United States.

The British Government has ordered work started this month on two new 35,000-ton battleships, calling for some 60,000 tons of iron and steel.

Germany has sold 15,000 tons of rails to the Far East at £5 5s. (\$24.26) f.o.b. The delivered price is considerably below the American, which including accessories averaged \$44.63 per gross ton against \$45.16 the British bid. On the rails alone the United States at \$43.50 was only 4c. below Great Britain.

Another slight drop in THE IRON AGE pig iron composite price brings it to \$25.71 per gross ton, compared with \$32.54 at the end of September.

For finished steel THE IRON AGE composite price, representing seven leading products, remains at 2.439c. per lb., compared with the 1922 high point of 2.474c., Oct. 3.

## Pittsburgh

### Heavy Selling of Pig Iron—Steel Moving More Freely

PITTSBURGH, Dec. 12.—Pig iron still holds the center of the stage. The drive for tonnages by merchant producers has continued and with some of the steel companies, besides those which have been selling for some little time, seeking business. The week has been one of extreme activity, and it is probable that fully 40,000 tons has been placed. The bulk of the business has been in foundry iron, although one or two fair-sized sales of steel-making grades are included. On foundry and basic grades \$25, furnace, has been the prevailing price. Producers of foundry iron are fairly well committed and are inclined to seek higher prices, but there is no evidence yet that more than \$25, furnace, can be obtained except on small lots. Bessemer iron has declined \$2.50 per ton and sales of malleable iron have been made at \$1 per ton below last week's price.

Loss of two Valley district furnaces from the active list last week has been more than counterbalanced by the blowing in of five Steel Corporation furnaces, these



## A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics  
At date, one week, one month, and one year previous

### For Early Delivery

Pig Iron, Per Gross Ton:	Dec. 12, 1922	Dec. 5, 1922	Nov. 14, 1922	Dec. 13, 1921
No. 2X Philadelphia...	\$28.76	\$29.14	\$31.14	\$22.26
No. 2 Valley furnace...	25.00	25.50	28.00	20.50
No. 2 Southern, Cin'tit...	26.55	27.05	27.05	22.00
No. 2 Birmingham, Ala.†	22.50	23.00	23.00	17.50
No. 2 foundry, Chicago...	28.00	28.00	30.00	20.00
Basic, del'd, eastern Pa...	27.50	27.50	28.14	21.00
Basic, Valley furnace...	25.00	25.00	28.00	19.00
Valley Bessemer, del. P'gh.	29.27	31.77	33.77	21.96
Malleable, Chicago*	28.00	28.00	30.00	20.00
Malleable, Valley	26.00	27.00	29.00	20.00
Gray forge, Pittsburgh...	26.77	26.77	29.77	21.46
Gray S. charcoal, Chicago...	36.15	36.15	36.15	31.50
Ferromanganese, furnace...	100.00	100.00	100.00	60.00

#### Rails, Billets, etc., Per Gross Ton:

o-h. rails, heavy, at mill.	\$43.00	\$43.00	\$43.00	\$40.00
Bess. billets, Pittsburgh...	36.50	36.50	38.00	29.00
o-h. billets, Pittsburgh...	36.50	36.50	38.00	29.00
o-h. sheet bars, P'gh...	36.50	36.50	38.00	30.00
Purging billets, base, P'gh	45.00	45.00	45.00	32.00
o-h. billets, Phila...	43.17	43.17	45.17	34.74
Wire rods, Pittsburgh...	45.00	45.00	45.00	38.00
Skelp. gr. steel, P'gh, lb...	2.00	2.00	2.00	1.50
Light rails at mill...	2.15	2.15	2.00	1.55

#### Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.275	2.275	2.235	1.95
Iron bars, Chicago...	2.35	2.35	2.50	1.65
Steel bars, Pittsburgh...	2.00	2.00	2.00	1.50
Steel bars, Chicago...	2.10	2.10	2.10	1.60
Steel bars, New York...	2.34	2.34	2.34	1.88
Tank plates, Pittsburgh...	1.95	1.95	2.00	1.50
Tank plates, Chicago...	2.30	2.30	2.30	1.60
Tank plates, New York...	2.29	2.29	2.34	1.83
Beams, Pittsburgh...	2.00	2.00	2.00	1.50
Beams, Chicago...	2.20	2.20	2.20	1.65
Beams, New York...	2.34	2.34	2.34	1.88
Steel hoops, Pittsburgh...	2.75	2.75	2.90	2.00

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. \$2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire,	Dec. 12, 1922	Dec. 5, 1922	Nov. 14, 1922	Dec. 13, 1921
Per Lb. to Large Buyers: Cents	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.35	3.35	3.35	3.00
Sheets, galv., No. 28, P'gh	4.35	4.35	4.50	4.00
Sheets, blue an'd, 9 & 10	2.50	2.50	2.60	2.25
Wire nails, Pittsburgh...	2.70	2.70	2.70	2.75
Plain wire, Pittsburgh...	2.45	2.45	2.45	2.50
Barbed wire, galv., P'gh...	3.35	3.35	3.35	3.40
Tin plate, 100-lb. box, P'gh	\$4.75	\$4.75	\$4.75	\$4.65

#### Old Material, Per Gross Ton:

Carwheels, Chicago...	\$24.00	\$24.00	\$25.00	\$16.00
Carwheels, Philadelphia...	20.00	20.00	21.00	16.50
Heavy steel scrap, P'gh	20.00	20.50	20.50	14.00
Heavy steel scrap, Phila...	16.00	16.00	16.50	11.50
Heavy steel scrap, Ch'go	17.00	17.00	17.50	11.00
No. 1 cast, Pittsburgh...	22.50	22.00	23.50	16.00
No. 1 cast, Philadelphia...	20.00	20.00	22.00	16.50
No. 1 cast, Ch'go (net ton)	19.50	19.50	20.50	12.50
No. 1 RR. wrot, Phila...	19.00	19.00	19.00	14.50
No. 1 RR. wrot, Ch'go (net)	15.00	15.00	16.00	10.50

#### Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt...	\$6.50	\$6.50	\$7.00	\$2.75
Foundry coke, prompt...	7.50	7.50	8.50	3.75

#### Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	14.12 1/2	14.12 1/2	14.12 1/2	13.75
Electrolytic copper, refinery	13.75	13.75	13.62 1/2	13.50
Zinc, St. Louis...	7.22 1/2	7.10	7.25	4.85
Zinc, New York...	7.57 1/2	7.45	7.60	5.20
Lead, St. Louis...	6.95	6.95	6.90	4.40
Lead, New York...	7.27 1/2	7.30	7.25	4.70
Tin (Straits), New York...	37.25	36.25	36.87 1/2	32.75
Antimony (Asiatic), N. Y.	6.35	6.40	6.60	4.50

#### Composite Price, Dec. 12, 1922, Finished Steel, 2.439c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets	Dec. 5, 1922, 2.439c. Nov. 14, 1922, 2.446c. Dec. 13, 1921, 2.135c. 10-year pre-war average, 1.689c.
These products constitute 88 per cent of the United States output of finished steel	

#### Composite Price, Dec. 12, 1922, Pig Iron, \$25.71 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham	Dec. 5, 1922, \$25.86 Nov. 14, 1922, 28.02 Dec. 13, 1921, 19.46 10-year pre-war average, 15.72
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including two of the American Steel & Wire Co., which blew in No. 1 furnace of its Shoenberger works Dec. 7 and its No. 2 on Dec. 10; one Lucy and one Mingo furnace, Carnegie Steel Co., and the second furnace of National Tube Co. at its Riverside works, Benwood, W. Va. There are now 99 out of 139 furnaces in the district bounded by Wheeling, Warren, Ohio, and Johnstown, Pa., in blast, the largest number in more than two years, and virtually twice as many as were active at the low point during the last week of August last. A few of the steel companies are making only enough iron for their actual requirements, but most of them are producing a surplus which they are either piling or offering on the open market.

Steel works activities in this district are at least 85 per cent. The recent order removing the restrictions on the use of open top cars has found very quick reflection in the movement of steel from the mills. Some of the sheet and tin plate manufacturers whose product moves chiefly in box cars have not been able to materially increase shipments because of a continued shortage of that kind of equipment, but those products which can be shipped safely in open top cars have been moving with marked freedom, and accumulations, notably of pipe, which resulted from their shortages during the height of the movement of coal to the lakes, have largely disappeared. Manufacturers of wire goods and pipe are not able to make much in cutting down their obliga-

tions, because the demand in those lines still is heavy and urgent, but real activity in other products is lacking because of the proximity of inventory time and the fact that deliveries of material on old and low-priced contracts are heavy enough to meet present requirements of buyers. The possibility of a recurrence of the coal strike on April 1 is undoubtedly causing considerable stocking against such an exigency.

There has been no special change in steel prices since a week ago. The effort of most manufacturers is to maintain 2c. base, Pittsburgh, on plates, shapes and bars, but there is no question that preferred customers are getting supplies at less and a quotation of 1.90c. is being made on sizable tonnages by some mills lacking substantial backlogs. The market is firmer on galvanized and blue annealed sheets than it is on black shapes, on which prices as low as 3.15c. base, Pittsburgh, are heard. Curtailment of beehive oven coke has failed to check the downward trend of prices and while \$6.50 per net ton at ovens is about as low as standard furnace grade is obtainable, it is also as high as any recent sales made. Coal prices also are weak.

**Pig Iron.**—While sales of the week have reached large proportions, prices have been in buyers' favor. One furnace interest in the past week has made sales aggregating more than 15,000 tons, including 5500 tons of gray forge at \$25, furnace; 6500 tons of No. 2 and No. 3 foundry at the same figure; 2000 tons of No. 3 iron

at \$25 and 1100 tons of No. 2X, No. 2 and No. 3 at \$26 for No. 2X and \$25 for the other grades. This business was done by a western Pennsylvania furnace, but a portion of tonnage was sold on a Valley furnace base. Another merchant interest with furnaces in the Valley has taken practically the same amount of business on a basis of \$25 for No. 2 grade. We also note sales of malleable iron amounting to about 1400 tons for first quarter delivery at \$25, Valley furnace. Of the steel-making grades, there was one sale of 1000 tons of Bessemer at \$29, Johnstown, this to a buyer having a low freight rate from that point and 1000 tons to a Pittsburgh district steel maker at \$27.50, Johnstown. The Valley market on this grade also is quotable at \$27.50, as a Valley steel maker, as well as a merchant producer in that district, has lately quoted that figure. A Pittsburgh district sheet maker has taken 2000 tons of basic at \$25, Valley furnace, and 4000 tons at a slightly lower figure in a trade arrangement with a steel company which involves a tonnage of skelp. Some malleable iron was included in sales of foundry iron from a western Pennsylvania furnace at \$25, furnace. Some of the merchant furnaces are now asking \$26, furnace, for No. 2 foundry, but the bottom does not yet seem to be reached on basic as brokers are quoting as low as \$24.75 on iron from the Valley.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.77 per gross ton:

Basic .....	\$25.00
Bessemer .....	27.50
Gray forge .....	25.00
No. 2 foundry .....	25.00
No. 3 foundry .....	25.00
Malleable .....	26.00
Low phosphorus, copper free .....	36.00

**Ferroalloys.**—A fair amount of business in ferromanganese is being figured on, but actual sales are moderate. Prices are unchanged at \$104.79, delivered Pittsburgh, common rate points, for either domestic or British 80 per cent material. The market definitely is weaker on spiegeleisen, especially for first quarter of 1923 delivery. We note sales aggregating more than 1000 tons at \$33 furnace, for average 20 per cent material for that delivery. On spot tonnages \$36, furnace, is asked for 20 per cent and \$35 for 16 to 19 per cent, but these prices are not supported by sales. The campaign of makers of 50 per cent ferrosilicon for 1923 contracts has not yet made much headway in this district, the feeling among consumers being that the increase in prices over those of last year is too great.

We quote 80 per cent ferromanganese at \$100, furnace, or \$104.79 delivered Pittsburgh district for either domestic or British, and 76 to 80 per cent German at \$67 c.i.f. Atlantic seaboard. Average 20 per cent spiegeleisen, \$37, furnace; 16 to 19 per cent, \$36 or domestic; 20 per cent, foreign, \$37 f.o.b. Atlantic seaboard, duty paid; 50 per cent ferrosilicon, domestic, \$82.50 to \$85, delivered. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, \$44.50; 11 per cent, \$47.80; 12 per cent, \$51.10; 13 per cent, \$55.10; 14 per cent, \$60.10; silvery iron, 6 per cent, \$33; 7 per cent, \$34; 8 per cent, \$35.50; 9 per cent, \$37.50; 10 per cent, \$39.50; 11 per cent, \$42; 12 per cent, \$44.50; 13 per cent, \$47. The present freight rate from Jackson and New Straitsville into the Pittsburgh district is \$3.66 per gross ton.

**Steel Skelp.**—The Steel Corporation still is fairly heavily committed on skelp, but independent mills have tonnages for sale and are quoting 2c. for either grooved or sheared in the pipe sizes and gages. Mills producing boiler tube skelp are getting \$2 to \$3 per ton above that figure.

**Wire Products.**—Pressure for deliveries against orders, particularly of nails, shows no material abatement and if forward buying is not heavy, it is because the mills are not actively seeking it. The leading interest still is largely out of the market in this district, but probably will be able to take on business for late first quarter delivery before long, since it is doing slightly better at its Donora, Pa., works in the matter of production and on Dec. 7 blew in a blast furnace at its Shoenberger works in Pittsburgh, after a suspension since April 11 last, which points to increased steel production at that plant. Prices are very firm on all products and where business has been lost by one company or another, it has been on account of delivery rather than the price. It is claimed that wire products are too low in price, but a belief that an advance at this

time would not rest well is keeping manufacturers in line at the prices set up last September. Prices are given on page 1607.

**Iron and Steel Pipe.**—The supply situation in steel pipe is slightly easier than it was a few weeks ago, due to the fact that the mills have been able to materially increase their shipments as a result of an increased supply of open top cars. The National Tube Co. not only is shipping its current production, but in the past few weeks has been able to move much of the pipe which piled up when cars were so scarce, during the heavy movement of coal to the lakes. This interest, however, still is 60 to 90 days behind its orders, being particularly heavily sold up on butt weld standard pipe. Its position in this respect, however, may soon be partly corrected by the fact that it now has both of its blast furnaces on at its Riverside works, Benwood, W. Va., with three butt weld furnaces on and two others scheduled to go in late this week. Independent mills note no let-up in the demand and they also are behind their orders and unable to give early promises on standard pipe. Oil country and line pipe obligations are lighter than those in standard pipe and fairly early shipments are being promised. Wrought iron pipe specifications are fairly good for the time of year. There are no suggestions of any immediate change in prices. Discounts are given on page 1607.

**Wire Rods.**—Mills in a position to take on any business are able to get \$47.50 per gross ton, base, but sales at that figure usually refer to early shipments and to buyers, not listed as regular customers of the selling mills. Regular customers are getting their supplies at \$45, base, both on current business and for first quarter of 1923. Most mills in this district are pretty heavily committed between old orders not fully completed and the business they have taken in the past month or so.

We quote No. 5 common basic or Bessemer rods to domestic consumers, \$45 to \$47.50; chain rods, \$45 to \$47.50; screw stock rods, \$50 to \$52.50; rivet and bolt rods and other rods of that character, \$45 to \$47.50; high carbon rods, \$52 to \$57.50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown. Carbon rods command \$3 over base for 0.20 to 0.40 carbon; \$5 over base for 0.41 to 0.55 carbon; \$7.50 over base for 0.56 to 0.75 carbon and \$10 over base for over 0.75 carbon.

**Billets, Sheet Bars and Slabs.**—A Pittsburgh district sheet maker recently closed for 6000 tons of sheet bars for delivery in equal amounts over the first quarter of 1923. The price is reported to have been \$37.50, Pittsburgh, but full confirmation is lacking and there is some question whether as high as that was paid in view of the fact that several independent makers have adopted the Steel Corporation base of \$36.50, Pittsburgh or Youngstown, as the basis of first quarter shipments to regular customers. The Steel Corporation has few outside semi-finished customers, but since they are competitors of those companies served by independent mills, the latter cannot at present, put their customers at a disadvantage with those of the Corporation by insisting on higher prices. The market is in an untested condition on billets and slabs, since there is very little business up, but the common belief is that they cannot be sold at any higher prices than sheet bars. Forging billets are quoted by the Steel Corporation at \$5 a ton over soft billets; using the nominal base of \$36.50 for soft billets, there is an indicated price of \$41.50 for forging steel. As high as \$45, however, still is being quoted on this form.

We quote 4 x 4-in. soft Bessemer and open-hearth billets, \$36.50; 2 x 2-in. billets, \$36.50; Bessemer sheet bars, \$36.50; open-hearth sheet bars, \$36.50; slabs, \$36.50; forging billets, ordinary carbons, \$41.50 to \$45, all f.o.b. Pittsburgh or Youngstown mills.

**Boiler Tubes.**—Leading makers of charcoal iron boiler tubes, as of Dec. 6, advanced prices \$10 per ton, through a reduction in the discounts of 5 points, the explanation being higher materials and labor costs. An Eastern maker of iron tubes and a producer in a small way of lap-welded steel tubes advanced the latter \$16 a ton, effective Dec. 6, but this announcement is regarded merely as one of withdrawal from the market by this interest and other producers are not expected to follow the advance. All kinds of boiler tubes are scarce as far as immediate supplies are concerned, with lapwelded steel tubes especially hard to secure promptly. Discounts are given on page 1607.



**Sheets.**—The leading interest reports business as good, but among independents, with the exception of those producing full-finished and electrical sheets, the report is that buyers are inclined to pursue a conservative course in purchases. It is reported that a new mill has gone as low as 3.15c., base, for black sheets to line up a backlog, but as a general rule, there is very little shading of the Steel Corporation bases of 3.35c. for black, 4.35c. for galvanized and 2.50c. for blue annealed. On full finished sheets, independents still are holding to 5c., base, for No. 22 gage, automobile body stock and probably will not be obliged to drop from this level, for while the Corporation base is 4.70c., it cannot take on much business for delivery before the second quarter. Mills operations are well maintained. Last week, the leading interest had more than 85 per cent of its sheets mills active and this week's schedule is right up to that gait. Independent mills are running about 80 per cent of capacity. Prices are given on page 1607.

**Tin Plate.**—Business is of about normal proportions for this time of the year. The leading interest has specifications for the bulk of its first quarter production, but this is not true of the independent mills, whose customers are not anticipating their requirements. The question of prices has lost interest, since leading independents have gone along with the Steel Corporation at \$4.75 per base box, Pittsburgh, for standard cokes. This, as is well understood, is the "official" quotation and large consumers have preferential treatment as to prices. The leading interest is operating at 73 per cent of capacity, due to a shortage of sheet bars at some of its plants. The general average of the industry is at about the same rate.

**Iron and Steel Bars.**—Most mills are holding steel bars and bar mill shapes at 2c. base, Pittsburgh, and a fair number of small orders has been entered at that figure. This is the top of the market, however, and regular customers are being accommodated at 1.90c. and attractive tonnages probably can be placed at the same figure. There has been no change in bar iron prices.

We quote steel bars rolled from billets at 2c.; reinforcing bars, rolled from billets, 2c. base; rail steel reinforcing bars, 1.90c. to 2c.; refined iron bars, 2.60c. in carloads, f.o.b. mill, Pittsburgh.

**Structural Material.**—While fabricating shops are not getting many new awards of any considerable size, they are figuring on a much greater number of inquiries than usual at this time of the year. Mill deliveries of plain material are heavier, but there is not much evidence yet of stocking by the fabricating shops. Prices are not very well defined. As with plates and bars, the mills are quoting 2c., but shading that price as much as \$2 per ton on desirable business. Prices are given on page 1607.

**Steel Rails.**—All makers of light rails, rolling them from new steel, are quoting 2.15c., base, but new business is not especially large at that figure and with re-rolled sections readily obtainable at 2c., base, there is reason to suppose that all sales of new steel rails are not at the quoted base. Railroads are specifying steadily on standard rails contracts.

We quote 25 to 45-lb. sections, rolled from new steel, 2.15c. base; rolled from old rails, 2c. base; standard rails, \$43 per gross ton mill for Bessemer and open-hearth sections.

**Plates.**—Most of the demands coming to mills here are for small tonnages, and while 2c. base is commonly quoted, it is doubtful whether much business is being placed at above 1.95c., and 1.90c. probably could be done on an order of fair size. Prices are given on page 1607.

**Cold-Rolled Strips.**—Although the market on hot-rolled strips is not especially well maintained at the established base of 2.90c. base, Pittsburgh, makers of cold-rolled strips claim that it has not been necessary for them to go below 4.50c., Pittsburgh, on this product. Business is described as good.

**Bolts, Nuts and Rivets.**—Business is of about the usual proportions for this time of year. Quoted prices show no change, but it is reported that some makers need orders badly enough to be willing to make concessions. Discounts and prices are given on page 1607.

**Cold-Finished Steel Bars and Shafting.**—There is no

occasion to change the price, which remains firm at 2.50c., base, Pittsburgh, for carloads, since there is a steady if not insistent demand and there is no sign right now that hot-rolled bars will be available in the near future as low as 1.75c., upon which the present price of 2.50c. for cold-finished bars is based. Ground shafting also holds firm on a base of 2.90c. for carloads at mill.

**Hot-Rolled Flats.**—The market still is quotable from 2.75c. to 2.90c., base, Pittsburgh. The higher figure is the regular market quotation, but evidently, there are some mills which find trouble in getting enough consumers to maintain mill schedules at that figure. Shading of the regular price seems to be more frequent in bands and strips than in hoops. Prices are given on page 1607.

**Track Fastenings.**—The interesting phase of the situation in these products is that the railroads tributary to this city, are advancing the delivery dates on their specifications. Prices show no change, although Eastern makers are underquoting local makers of small spikes by as much as \$5 per ton. Current demands are seasonably light. Prices are given on page 1607.

**Coke and Coal.**—The coke market still is weak, in spite of efforts to steady it through curtailed production. Supplies of furnace grade still are more than ample for current requirements, in view of the fact that \$6.50 per net ton at ovens, last week's minimum standard grade, is this week's maximum. Coal oven operators are talking \$7 and higher for early 1923 contracts, but in naming such a price are evidently figuring on probable weather conditions, rather than on what furnace interests will pay. The foundry coke market is fairly steady at \$7.50 to \$8 per net ton at oven. There is not enough demand for coal to sustain the market. While coking coal for delivery over an extended period is not available at less than \$3.25 and some are asking \$3.50, the market on small tonnages for prompt delivery is \$2.75 to \$3. Gas coal is quoted within the same limits and steam coal ranges from \$2.25 to \$3.

**Old Material.**—We note sales of heavy melting steel to Pittsburgh district steel companies aggregating about 15,000 tons, at prices varying from \$20 to \$20.75 per gross ton, delivered. The business included 10,000 tons at the higher figure, but this was to a plant having a freight rate of about 50c. per ton higher than most Pittsburgh-district mills, and the market on this grade is now properly quoted at \$20 to \$20.50, a decline of 50c. per ton from a week ago. Demands from melters generally are light and the undertone of the market is soft. Dealers do not appear anxious for tonnages around these prices, and barring an early revival of activity and strength in outside markets, it looks as though lower prices are ahead here. Cast scrap has been strengthened by an order for a small lot for quick delivery. No. 1 cupola cast scrap a week ago should have been \$22 to \$22.50 and compressed sheets \$19.50 to \$20; inadvertently, the latter was quoted last week at \$22 to \$22.50, which was an error.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$20.00 to \$20.50
No. 1 cast, cupola size.....	22.50 to 23.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; and Franklin, Pa.....	20.50 to 21.00
Compressed sheet steel.....	19.50 to 20.00
Bundled sheet sides and ends....	17.50 to 18.00
Railroad knuckles and couplers....	21.50 to 22.00
Railroad coil and leaf springs....	21.50 to 22.00
Low phosphorus standard bloom and billet ends.....	24.00 to 24.50
Low phosphorus, plates and other grades.....	23.00 to 24.00
Railroad malleable.....	20.00 to 20.50
Iron car axles.....	28.00 to 29.00
Locomotive axles, steel.....	23.00 to 24.00
Steel car axles.....	21.50 to 22.00
Cast iron wheels.....	22.00 to 22.50
Rolled steel wheels.....	21.50 to 22.00
Machine shop turnings.....	15.50 to 16.00
Heavy steel axle turnings.....	17.00 to 17.50
Short shoveling turnings.....	17.00 to 17.50
Cast iron borings.....	17.50 to 18.00
Heavy breakable cast.....	18.50 to 19.00
Stove plate.....	16.50 to 17.00
Sheet bar crop ends.....	22.50 to 23.00
No. 1 railroad wrought.....	18.50 to 19.00

## Chicago

### Heavy Buying of Pig Iron—Improved Demand for Steel Bars

CHICAGO, Dec. 12.—Heavy buying of pig iron has halted the decline which had extended over several weeks. Demand for finished steel is holding its own, the bookings of a leading producer being on the same plane for some time. The most encouraging development lies in active inquiry for first quarter steel from farm implement makers. For the first time in two years, these manufacturers report a sufficient resuscitation in demand to justify operations on a broad scale. With increased requisitions from the implement industry and prospects of continued demand from car builders, railroads, concrete bar dealers, fabricators, automotive plants and makers of shafting, bolts, nuts and rivets, mills believe that bookings will tax their capacity through and beyond first quarter.

Inquiries for 45,000 railroad cars are pending, and the placing of these together with present orders will engage the plants of car builders for six months. The programs of Western railroads for the first six months of next year call for large expenditures on both rolling equipment and track maintenance. While deliveries are somewhat improved owing to better mill operations, car builders, concrete bar dealers and others still complain that they are not receiving their full needs. Users of semi-finished material, in particular, are short of stocks and in a number of cases have found it necessary to buy from Eastern mills. A shipment of 5500 tons of billets was recently moved by boat from Buffalo.

The Illinois Steel Co. has added a blast furnace at Gary, giving it 10 active stacks at that works, eight at South Chicago, two at Joliet and one merchant furnace at Milwaukee.

**Pig Iron.**—Buying has been very heavy during the past week. At the beginning of the buying movement considerable tonnage was booked at \$27 base, local furnace, but the usual quotation soon became \$28 base. The bookings of a leading merchant to-day exceeded 30,000 tons and the total tonnage taken since the first of last week will engage the capacity of furnaces in this district over the larger part of first quarter. Several sales of 10,000 tons each have been made and many more, ranging from 7500 tons down to 500 tons. Buying has not only been liberal, but it has been for both first quarter and first half. Practically every melter in the district has been or is in the market. One inquiry still pending calls for 3600 tons of malleable for Indiana delivery and 850 tons of foundry and 150 tons of silvery for Chicago shipment. Prices of Southern iron are still somewhat uncertain. Although most producers are quoting \$23 base, Birmingham, a sale at \$22 for Michigan delivery has just been made and one furnace is openly quoting \$22.50 base. A local buyer is inquiring for 1000 tons of low phosphorus for local delivery and 500 tons for shipment to a plant on the Atlantic seaboard. Both domestic and foreign material are available at from \$36 to \$37 delivered. A Milwaukee producer is expected to go in on low phosphorus next Monday. Four hundred tons of silvery for Detroit shipment and several carload lots for Chicago district delivery have been sold at the new schedule. Charcoal iron is quiet with occasional reports of slight concessions. Toledo and Detroit producers of foundry and malleable have advanced prices \$1 to \$27, furnace.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	\$36.15
Northern coke, No. 1, sil. 2.25 to 2.75	28.50
Northern coke, foundry No. 2, sil. 1.75 to 2.25	28.00
Malleable, not over 2.25 sil.	28.00
Basic	28.00
High phosphorus	28.00
Southern, No. 2	\$28.01 to 29.01
Low phos., Valley furnace, sil. 1 to 2 per cent copper free	36.00 to 37.00
Silvery, sil. 8 per cent	40.29

**Ferroalloys.**—A carload sale of spiegeleisen for Chicago delivery indicates a drop of \$1 in the market. A few carloads of ferromanganese have been disposed of and prices appear firm at \$100 seaboard. Melters continue to contract for their 1923 requirements of 50 per cent ferrosilicon and the minimum quotation appears to be \$82.50 delivered.

We quote 80 per cent ferromanganese, \$107.50 delivered; 50 per cent ferrosilicon, \$80 to \$82.50 delivered; spiegeleisen, 18 to 22 per cent, \$46.05, delivered.

**Plates.**—The number of railroad cars pending has increased to 45,000 during the week and additional inquiries to be put out soon will call for 6000 more. With their present bookings and the orders which will be received when this pending business is closed, railroad car builders will have sufficient work to engage their capacities for six months. New business in plates is coming to the mills at about the same rate as for several weeks and one important producer has turned down orders because it could not make the deliveries desired. Notwithstanding improved operations, mills still find it difficult to supply customers with all the material they need. They are especially pressed for steel by the car builders. Oil storage tanks involving 16,000 tons of plates are still unplaced.

The mill quotation is 2.10c. to 2.30c., Chicago. Jobbers quote 2.90c. for plates out of stock.

**Cast Iron Pipe.**—Akron, Ohio, takes bids on 536 tons of 6 to 12-in., Dec. 16. Municipal inquiries are decidedly few and private buying is not particularly active. Pipe shops, however, are booked full for 30 to 60 days and are not much concerned about new business for the present.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$55.20 to \$56.20; 6-in. and above, \$51.20 to \$52.20; class A and gas pipe, \$3 extra.

**Rails and Track Supplies.**—The production of the Gary mill has been increased from 7000 to 9000 tons a week, indicating a somewhat heavier pressure for shipments. Specifications for track supplies are liberal and new business is good. The Chesapeake & Ohio is inquiring for 5800 kegs of spikes and bolts for prompt shipment and 10,000 kegs for first quarter. The Great Northern is in the market for 5500 kegs of spikes and bolts representing a month's requirements. A number of roads did not place their track fastenings when they contracted for their rails, preferring to buy their needs from month to month. Demand for light rails is poor.

Standard Bessemer and open-hearth rails, \$43; light rails rolled from new steel, 2.15c., f.o.b. makers' mills.

Standard railroad spikes, 2.85c. to 3c. mill; track bolts with square nuts, 3.85c. to 4c., mill; iron tie plates, 2.50c.; steel tie plates, 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.50c. base and track bolts, 4.50c. base.

**Bars.**—For the first time in two years, farm implement manufacturers report a sufficient revival in demand from the farmer to warrant a marked expansion in their production programs. They are now placing their first quarter requirements in bars as well as in other materials to supplement unused stocks still on hand. Demand for soft steel bars continues to come from a diversity of sources, but is notably strong from dealers in reinforcing bars who complain that deliveries are below their needs. Prices are unchanged. New business in bar iron is of fair proportions but not sufficient to warrant satisfactory mill operations. The minimum quotation on this product is 2.35c. mill. Buying of hard steel bars is lagging, but prices remain unchanged.

Mill prices are: Mild steel bars, 2c. to 2.10c. Chicago; common bar iron, 2.35c. to 2.50c., Chicago; rail steel, 2c., Chicago mill.

Jobbers quote 2.80c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.80c. for rounds and 4.30c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 4.15c.; bands, 3.55c.

**Wire Products.**—Pressure for deliveries has been relieved, but buying for shipment after the first of the year is in good volume. Jobbers throughout the West look for a healthy spring demand and are taking steps to protect themselves accordingly. The operations of



the leading interest are unchanged at 65 per cent, but next week it is planned to reopen the Anderson, Ind., plant which has been idle for about three months. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 1607.

We quote warehouse prices f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, \$3.30 per 100 lb.; common wire nails, \$3.45 per 100 lb.; cement coated nails, \$2.90 per keg.

**Bolts and Nuts.**—The placing of first quarter contracts is slowly gaining headway and discounts appear to be holding steadily. Specifications against fourth quarter contracts are fair and bolt and nut plants are maintaining their recent working schedules.

Jobbers quote structural rivets, 3.75c.; boiler rivets, 3.85c.; machine bolts up to  $\frac{3}{4}$  x 4 in., 50 per cent off; larger sizes, 50 off; carriage bolts up to  $\frac{3}{4}$  x 6 in., 45 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, \$2.75 off; blank nuts, \$2.75 off; coach or lag screws, gimlet points, square heads, 55 per cent off.

**Reinforcing Bars.**—Sales are keeping up well, although a holiday lull is expected to be felt soon. During the week one large dealer sold a total of 1500 tons for first quarter delivery to fabricators of concrete work in various sections of the West. Individual lettings over 100 tons have not been so numerous, although one project awarded, a sewage disposal plant at Indianapolis, involves 1250 tons. Considerable prospective work continues to develop, notably road construction. General contracts will soon be awarded on 200 miles of Illinois highway work involving 2000 tons. The largest pending building project is the South Chicago assembly plant of the Ford Motor Co., which will take fully 1000 tons of bars instead of a few hundred tons as was first estimated.

Prospective business includes:

State of Illinois, 200 miles of road work, 2000 tons, bids on general contract to be taken at Springfield Dec. 21.  
Ford Motor Co., assembly plant, South Chicago, 1000 tons.  
Evanston, Ill., high school buildings, 515 tons, Avery Brundage, low bidder on general contract.  
Addition to Calumet power station, Commonwealth Edison Co., Chicago, 300 tons still pending.  
Court house, Kenosha, Wis., 200 tons, bids on general contract to be taken Dec. 27.  
Mount Clemens, Mich., high school building, 150 tons, bids to be taken on general contract Dec. 20.  
Baptist hospital, Louisville, Ky., figures on general contract to be in Dec. 14, tonnage not yet estimated.  
Evansville, Ind., high school, 100 tons, general contract to be let Dec. 13.  
United Butchers Packing Co. plant, Chicago, 425 tons.

Awards include:

Sewage disposal plant, Indianapolis, Ind., 1250 tons, to Truscon Steel Co.  
Illinois road work, 700 tons, to Truscon Steel Co.  
Addition to Calumet power station, Commonwealth Edison Co., Chicago, 210 tons, to Truscon Steel Co.  
Mengel Box Co. plant, Louisville, Ky., 150 tons, to Corrugated Bar Co.  
Coney Island Bank building, Coney Island, N. Y., 100 tons, to Kalman Steel Co.

**Sheets.**—Both local producers are booked through first quarter and are unable to take care of the full requirements of their customers who are placing the rest of their needs with outside mills. Prices are firm.

Mill quotations are 3.35c. for No. 28 black 2.50c. for No. 10 blue annealed and 4.35c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.  
Jobbers quote f.o.b. Chicago, 4c. for blue annealed, 4.85c. for black and 5.85c. for galvanized.

**Semi-finished Material.**—A boatload of 5500 tons of 1 $\frac{1}{4}$ -in. billets shipped from Buffalo has been delivered to a local mill and about 3000 tons additional are to come in a later shipment. Users of semi-finished material throughout this district have found Chicago mills unable to supply their full requirements and have been forced to buy in the East. Even the Steel Corporation subsidiary came into the market last week for sheet bars and the best quotation it obtained was \$40, local mill.

**Structural Material.**—Fabricating awards reported here during the week total 5163 tons, of which 2300 tons is represented by a single project, a new power station at Joliet. A number of large jobs are now being figured, among them three involving 4000 tons each

and one of 3000. An unusual amount of new work is coming out for this season. Plain material prices are unchanged.

The mill quotation on plain material is 2.10c. to 2.20c., Chicago. Jobbers quote 2.90c. for plain material out of warehouses.

**Steel Castings.**—Some of the leading makers are now investigating labor and material costs as a basis for working out prices for first quarter. Whether or not any changes will be made is as yet problematical. Although there have been some weak spots in the market, notably in quotations of car castings, the present tendency appears to be toward general firmness.

**Old Material.**—Consumers are still showing little interest in the market and it is now thought unlikely that they will come in for much additional tonnage before the first of the year. Sentiment among dealers, however, is improved and the general feeling is that prices have reached bottom and that the next movement will be upward. During the past week, quotations have shown very little change. Railroad offerings are lighter, new lists including the Wabash, 1200 tons; the Great Northern, 1500 tons and the Soo Line and the Chicago Great Western 800 tons each.

We quote delivery in consumers' yards Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	\$22.00 to \$22.50
Cast iron car wheels	24.00 to 24.50
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	32.00 to 35.00
Rolled or forged steel car wheels	22.00 to 22.50
Rails for rolling	17.50 to 18.00
Steel rails, less than 3 ft.	19.00 to 19.50
Heavy melting steel	17.00 to 17.50
Frogs, switches and guards cut apart	17.00 to 17.50
Shoveling steel	16.50 to 17.00
Drop forge flashings	12.00 to 12.50
Hydraulic compressed sheet	13.50 to 14.00
Axle turnings	15.00 to 15.50

Per Net Ton	
Iron angles and splice bars	21.00 to 21.50
Steel angle bars	16.50 to 17.00
Iron arch bars and transoms	21.00 to 21.50
Iron car axles	24.00 to 24.50
Steel car axles	17.50 to 18.00
No. 1 busheling	13.75 to 14.25
No. 2 busheling	9.00 to 9.50
Cut forge	15.00 to 15.50
Pipe and flues	10.50 to 11.00
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	15.00 to 15.50
Steel knuckles and couplers	19.50 to 20.00
Coil springs	21.00 to 21.50
No. 1 machinery cast	19.50 to 20.00
No. 1 railroad cast	18.00 to 18.50
Low phos. punchings	17.00 to 17.50
Locomotive tires, smooth	15.50 to 16.00
Machine shop turnings	9.25 to 9.75
Cast borings	13.00 to 13.50
Stove plates	16.00 to 16.50
Grate bars	16.00 to 16.50
Brake shoes	16.00 to 16.50
Railroad malleable	20.00 to 20.50
Agricultural malleable	20.00 to 20.50

## Standardizing Scrap

**PITTSBURGH, Dec. 12.**—Purchasing agents representing about 14 of the steel plants in this and nearby districts held a meeting at the William Penn Hotel here to-day, under a call from H. V. Smallwood, Wheeling Steel Corporation, Wheeling, W. Va., who presided at the meeting, to consider the subject of standardization of scrap specifications. It was stated at the conclusion of the meeting, which was behind closed doors, that except for a general discussion of the subject, nothing was done.

The Worthington Pump & Machinery Corporation, employing 5000 to 8000, has taken out group insurance to the amount of \$5,000,000 for its employees. Each employee is insured for \$250 the first year, for \$500 for the second year, and for \$100 additional for each year thereafter, with the maximum \$1,000.

To purify coke oven gas for use in the open-hearth furnaces, the Koppers Co., Pittsburgh, will install a liquid purification plant of 12,000,000 cu. ft. capacity at Midland, Pa., for the Pittsburgh Crucible Steel Co. It is expected that the plant will be put into operation by the first of March and the results will naturally be watched with interest.

## New York

### Buying of Pig Iron Continues with Some Makers Marking Up Prices

NEW YORK, Dec. 12.—Buying of pig iron has proceeded at a satisfactory rate. The present tendency is toward higher prices, but no sales are reported at the new quotations which have been named, and it remains to be determined whether there will be an advance over prices which prevailed for the first quarter. Buying has been largely for delivery up to April 1 and most melters are pretty well covered for that period, but in the case of a prominent foundry company which placed an order for 5000 tons, delivery will extend over the second quarter and some smaller tonnages also will be for that period. The principal buyer of the past week was the Worthington Pump & Machinery Corporation, which purchased about 5000 tons of domestic iron, largely from Buffalo, for delivery at Harrison, N. J., 350 tons; Buffalo, 1600 tons; Elmwood Place, Ohio, 1000 tons; Holyoke, Mass., 980 tons, and East Cambridge, Mass., 740 tons, and one or two other points, all for shipment the first quarter of next year. Prices it paid are understood to have been on a basis of about \$25, Buffalo, for the greater part of the tonnage. A stove company has purchased some 3000 to 4000 tons for delivery in the first quarter. Other buying has been in smaller lots by numerous companies. The American Car & Foundry Co. is in the market for 1500 tons of foundry malleable for December-January delivery. An inquiry for 2000 tons of basic for prompt delivery has appeared. Transactions in foreign iron include one of 500 tons and a number of smaller lots. One Buffalo seller is now quoting No. 2X, No. 2 plain and malleable at the same price, \$26, and No. 2 at \$26.50, but no sales are reported at these figures. Continental iron is selling at \$26 to \$26.50, duty paid, and Scotch, \$27.50, duty paid.

We quote delivered in the New York district as follows, having added to furnace prices \$2.27 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25.....	\$33.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75.....	32.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25.....	29.27
Buffalo, sil. 1.75 to 2.25.....	29.91
No. 2X Virginia, sil. 2.25 to 2.75.....	34.44
No. 2 Virginia, sil. 1.75 to 2.25.....	33.44

**Ferroalloys.**—Demand for ferromanganese is very light and confined to small lots for early delivery, consumers requirements being fairly well covered by contract. Quotations continue unchanged and firm. Some business in spiegeleisen has been done but the volume is not large. Contracts for 50 per cent ferrosilicon for 1923 consumption are being rapidly consummated all over the country at \$82.50 to \$87.50, delivered. Quotations are as follows:

Ferromanganese, domestic, furnace, nominal per ton.....	\$100.00
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port.....	\$100.00
Spiegeleisen, 17 to 19 per cent, furnace.....	\$36.00
Spiegeleisen, 20 per cent, furnace or duty paid.....	\$37.00 to \$38.00
Ferrosilicon, 50 per cent, delivered, per gross ton, carloads.....	\$82.50
Ferrotungsten, per lb. of contained metal, 90c. to 95c.	
Ferrochromium, 4 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered.....	14c.
Ferrovanadium, per lb. of contained vanadium.....	\$3.50 to \$4.00
Ferrocobalt, 15 to 18 per cent, in carloads, per net ton.....	\$200.00

#### Ores

Manganese ore, foreign, per unit, c.i.f. 29c. to 30c.	
Tungsten ore, per unit, in 60 per cent concentrates, nominal.....	\$7.50 to \$8.50
Chrome ore, basis 48 per cent Cr <sub>2</sub> O <sub>3</sub> , crude, per ton, c.i.f. Atlantic seaboard.....	\$18.00 to \$28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS <sub>3</sub> , New York.....	55c. to 60c.

**Cast Iron Pipe.**—Business is unusually good for the winter season and numerous inquiries and orders for spring delivery are reported by one maker in this district. The demand is particularly heavy for small sizes of gas pipe, 4 in. and 6 in. and no objections are made to current prices, which are firm. Municipal tenders have ceased for this year, but several are expected in January. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$54.50; 4-in. and 5-in., \$59; 3-in., \$64.80, with \$4 additional for Class A and gas pipe. In the soil pipe market business con-

tinues good, but there are continued reports of a softening in prices. It is reported that in some instances the current discounts have been increased by as much as 5 points. We quote discounts of both Southern and Northern makers, delivered New York, as follows: 2 to 6-in. standard, 33 to 35% per cent off list; heavy 43 to 45% per cent off list.

**High Speed Steel.**—The market is quiet and unchanged. Producers continue to quote 75c. to 80c. per lb. for 18 per cent tungsten high speed steel, with special brands of some companies ranging up to 90c. per lb.

**Warehouse Business.**—Business continues good in practically all lines, but orders are reported to be decreasing in size as the end of the year draws near. In black and galvanized sheets, one factor in this market reports considerable business, most of which is for next year delivery and some of the orders for spring delivery. Prices are reported firm with the exception of sheets, which are now holding fairly well at from 4.50c. to 4.75c. per lb. base, on black and about 5.50c. per lb. base on galvanized. Prices on galvanized are reported to have been shaded in transactions where the tonnage was of any size, as low as 5.25c. per lb. having been done occasionally. Discounts on wrought iron and steel pipe are firm on the present basis and business continues good. One warehouse reports considerably better business last month than in November, 1921. Brass and copper prices are unchanged and business good, with little or no decrease in business noted during this last month of the year. We quote prices on page 1622.

**Finished Iron and Steel.**—A surprise of December is the volume of building construction that is being contracted for and figured upon. This is usually the duller time of the year and activity for spring work is not expected until about the last of January. While the volume of the work in the market is smaller than that of a few months ago, it totals much larger than the trade looked for. For example, the projects awarded in the Eastern district during the past week aggregate more than 7500 tons and new projects on which nearby fabricators are figuring total nearly 5000 tons. The demand for concrete bars also is keeping up, a large number of small jobs replacing the large jobs which were being figured on a few months ago. As the first quarter of the year approaches there is noticeable a stiffening in prices and the mills are not willing to make concessions from 2c., Pittsburgh, on bars and shapes. On plates prices are not quite so well defined as the large excess of plate-producing capacity creates a situation for which there seems to be no remedy in sight. Orders from manufacturing consumers and jobbers are generally of a fill-in character, and while some of the mills have opened their books for first quarter contracts, buyers have taken hold only in a small way. Some large tin plate contracts have been booked, but in other products the tendency is still to let the future take care of itself. Railroad car business keeps up at a fairly good rate. The Baltimore & Ohio has inquired for 1000 box cars, making 5000 cars which this road will probably buy soon. The Union Tank Car Co. has ordered 3000 steel tank cars.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, structural shapes and steel plates, 2.39c.; bar iron, 2.34c.

**Coke.**—Prices continue to be well maintained with very little change. Furnace is usually selling at \$7 and foundry at \$7.75 to \$8.50, with by-product quoted at \$14.84 to \$14.91, delivered Newark and Jersey City points. The market for both grades has been strengthened somewhat by the fact that dealers are making a drive to sell coke for domestic purposes as a substitute for anthracite, owing to the difficulty in obtaining the latter.

**Old Material.**—Prices are weak on practically all grades, but there is an inclination to point to the fact that mills at present are withholding offers because of the approach of the end of the year and the usual inventory, after which, because of the small stocks of scrap in mill yards, a resumption of buying is expected. At present No. 1 heavy melting steel is not quotable at much better than \$11.50 to \$12.50 per ton, as a buying price, New York. Railroad quality or equivalent, based upon \$16, delivered, paid by the Bethlehem Steel Co., and shipments to the Jones & Laughlin Steel Co. and



Pittsburgh Steel Co. at Monessen, is fairly firm at \$13.50 to \$14, New York. Wrought scrap is generally weak and few transactions are noted. While a fair estimate of the market on mixed borings and turnings is \$11 to \$11.50 per ton, one dealer in this district states that he has been offered a small tonnage at \$10 per ton. Stove plate is fairly firm, considering the general inactivity in other grades of scrap. A Phoenixville mill, which has been buying stove plate at \$16.50 and \$16 per ton, delivered, has dropped out of the market, but shipments are still going to Harrisburg. A consumer at Perth Amboy recently bought a small tonnage at \$16 per ton delivered and a Mahwah, N. J., plant is again buying. Specification pipe is quiet, with the chief buying by a Lebanon mill at \$14 per ton and rigid inspection of shipments.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard.....	\$11.50 to \$12.50
Steel rails, short lengths, or equivalent.....	13.50 to 14.00
Rails for rolling.....	16.00 to 16.50
Relaying rails, nominal.....	21.00 to 22.00
Steel car axles.....	No market
Iron car axles.....	25.00 to 26.00
No. 1 railroad wrought.....	14.00 to 14.50
Wrought iron track.....	13.50 to 14.00
Forge fire.....	11.00 to 11.50
No. 1 yard wrought, long.....	13.00 to 13.50
Cast borings (clean).....	12.00 to 12.50
Machine-shop turnings.....	11.00 to 11.50
Mixed borings and turnings.....	11.00 to 11.50
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	9.75 to 10.25
Stove plate.....	12.25 to 13.25
Locomotive grate bars.....	13.00 to 13.50
Malleable cast (railroad).....	13.50 to 14.00
Cast-iron car wheels.....	16.50 to 17.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$19.00 to \$20.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	17.00 to 17.50
No. 1 heavy cast, not cupola size.....	15.00 to 15.50
No. 2 cast (radiators, cast boilers, etc.).....	13.50 to 14.00

## Birmingham

### Production Highest of Year—Pipe Company Bought Pig Iron at \$22.50

BIRMINGHAM, ALA., Dec. 12.—At the close of last week the Birmingham iron market seemed to be on the base of \$23, with three makers out of the market on well-filled first quarter capacity except at higher prices. The general run of small spot business in the South was from \$24 to \$25. Two lots of iron carrying two higher silicon differentials brought \$26, or a \$25 base and 50c. for each silicon differential. It now seems well established that a large pipe maker closed for 15,000 to 20,000 tons on a base of \$22.50, one maker booking three-fourths of the tonnage. The tonnage included several grades and the price was averaged on the \$22.50 base. This business was taken on the heels of the withdrawal of the low of \$21 made by a one-furnace interest which advanced to \$23, and then went out of the market. Lots of 500 and 1000 tons have been booked for St. Louis and Cincinnati territory at \$23. Southern consumers drew in following the low base, but are on the serious inquiry bench. The total of around 60,000 tons booked week before last was by small makers. The larger makers have not been conspicuous in the market, although one opened up this week at \$23 and placed an average of 500 to 1000 tons per day at that price. While the Sloss-Sheffield Steel & Iron Co. is back to a five-furnace production, the Woodward Iron Co. went to a four-furnace production Dec. 1, but the blown-out stack will be relined and go in again Jan. 1, it is expected. November iron production was the largest of the year, length of the month considered, and almost 100 per cent in excess of the production a year ago.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon, 1.75 to 2.25.....	\$23.00
Basic.....	23.00
Charcoal, warm blast.....	32.00

**Cast Iron Pipe.**—Presumably the 20,000 tons of pipe for San Juan, Porto Rico, will be turned out in the Alabama shops of the United States Cast Iron Pipe & Foundry Co. This interest also booked 1550 tons for Chicago. The reported cut to \$40 on some Southern business by one Birmingham pressure pipe maker is

reported, but the base remains at \$42.50 to \$43. Soil pipe remains dull with makers nominally quoting \$55.

**Coal and Coke.**—Coke brings \$7.50 to \$8, with some spot sales at \$8.50. Coal is easy, with average of less than \$3 for run of mine.

**Old Material.**—Scrap has been featureless, with none of the large buyers in the market, and the small consumers paying the quoted price.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails.....	\$16.00 to \$17.00
No. 1 steel.....	14.00 to 16.00
No. 1 cast.....	18.00 to 20.00
Car wheels.....	18.00 to 20.00
Tramcar wheels.....	17.00 to 19.00
Stove plate.....	16.00 to 17.00
Cast-iron borings.....	9.00 to 10.00
Machine shop turnings.....	9.00 to 10.00

## Boston

### Approximately 30,000 Tons of Pig Iron Sold During Past Fortnight

BOSTON, Dec. 12.—The domestic pig iron market in this territory appears to be firmer. Buffalo iron, heretofore \$25 furnace for No. 2 plain and No. 2X, and eastern Pennsylvania, which went as low as \$26 furnace base, are quoted by at least some sellers \$1 higher; Alabama, which dropped to \$21 for a few hours, is usually quoted \$23. At the lower prices approximately 12,000 tons was sold, bringing total transactions in New England, exclusive of whatever may have been placed in Connecticut through New York houses, to more than 27,000 tons the past fortnight. With foreign iron, at least 30,000 tons was sold. Since the advance in asking prices business has flattened out to almost nothing. Foreign iron sales, as indicated, were small with the closing out of odds and ends by the less important interests. More important accounts are not forcing iron on the market. Reports of German iron sales are more or less unreliable. Of the fortnightly sales, two textile machinery makers took 10,000 tons, the rest being split up among heater, valve and general castings manufacturers. The largest pending inquiry is from the Worthington Pump & Machinery Corporation for three plants, first quarter delivery. It is for 3040 tons, divided as follows: Silicon 1.75 to 2.25, 150 tons; silicon, 2.00, 500 tons; silicon 2.25, 150 tons; silicon, 2.50, 300 tons; silicon 2.25 to 2.75, 240 tons; silicon 2.75 to 3.25, 300 tons; silicon 3.25 to 3.75, 950 tons; silicon 3.75 to 4.25, 400 tons; silicon 4.50, 50 tons.

We quote delivered prices on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia and \$9.60 from Alabama:

Eastern Penn., sil. 2.25 to 2.75.....	\$31.15 to \$32.15
Eastern Penn., sil. 1.75 to 2.25.....	30.65 to 31.65
Buffalo, sil. 2.25 to 2.75.....	29.91 to 31.41
Buffalo, sil. 1.75 to 2.25.....	29.91 to 30.91
Virginia, sil. 2.25 to 2.75.....	33.42 to 34.42
Virginia, sil. 1.75 to 2.25.....	32.92 to 33.92
Alabama, sil. 2.25 to 2.75.....	33.10
Alabama, sil. 1.75 to 2.25.....	32.60

**Iron Imports.**—Imports of iron at this port for the week ending Dec. 9, amounted to 560 tons of Belgian, whereas, for the previous week they were 2100 tons of Middlesbrough, Eng. During the week of Dec. 9, 125 tons of English ferro manganese were received at this port.

**Warehouse Business.**—The demand for iron and steel is less active, yet sales, as compared with a year ago, are much larger. The recent advance in bolts and nuts so far has failed to curb buying. The wire nail situation is not as acute as it was a month ago, but could be better. Horseshoes are doing fairly well. Warehouse prices on iron and steel are reported as steady and unchanged.

Jobbers quote: Soft steel bars, \$3.065 per 100 lb. base; flats, \$3.85; concrete bars, 3.16½c.; structural steel, \$3.065 to \$3.50; tire steel, \$4.50 to \$4.85; open-hearth spring steel, \$5 to \$6.50; crucible spring steel, \$12; steel bands, \$4.25; hoop steel, \$4.75; cold rolled steel, \$4 to \$4.50; refined iron, \$3.065; best refined iron, \$4.50; Wayne iron, \$5.50; Norway iron, \$6.60 to \$7.10; plates, 3.16½c. to \$3.35; No. 10 blue annealed sheets, \$4.15 per 100 lb. base; No. 28 black sheets, \$5.40; No. 28 galvanized sheets, \$6.40.

**Coke.**—Coke prices remain unchanged, both the New England Coal & Coke Co. and the Providence Gas Co.

continuing to quote foundry fuel at \$16 delivered within the \$3.10 freight zone. The movement of coke from ovens to consumers has slowed up and one producer is all of two weeks behind on deliveries. The trouble is due not so much to a car shortage as to the inability of the transportation companies to handle freight. At no time during the strike, or since then, has the congestion in freight yards been as pronounced as it is to-day. Faulty locomotives are at the bottom of New England's transportation problem.

**Old Material.**—Although not brisk, business is more active than in early December and better than anticipated, notwithstanding embargoes have held up shipments west of Pittsburgh. Activity centers largely in heavy melting steel and in blast furnace borings and turnings, although chemical borings are doing better and miscellaneous material is selling. Heavy melting steel sold at \$14 to \$14.50 shipping point, largely for one account in the Pittsburgh district, while borings and turnings for Ohio delivery, first sold as high as \$11.75 f.o.b. cars, and more recently at \$11. Chemical cast iron borings, in round tonnages, brought \$16 and \$16.50 on cars, shipping point, with 100 tons selected material, fetching \$17. Shafting at \$19.50 and \$20, shipping point, or \$21.50 to \$22.60 delivered, and horse-shoes at \$15 to \$15.50 on cars or around \$20.50 delivered New Jersey, figured in the week's transactions. Passing business suggests New England foundries are using less machinery cast. Pennsylvania Railroad officials hold out little encouragement for the lifting of embargoes. The Boston & Albany Railroad has embargoed scrap and pig iron.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery.....	\$20.00 to \$22.00
No. 2 machinery cast.....	18.00 to 20.00
Stove plate.....	16.50 to 17.00
Railroad malleable.....	20.50 to 21.00
Bundled sheets.....	14.00 to 14.50
Car wheels.....	20.00 to 20.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$14.00 to \$14.50
No. 1 railroad wrought.....	13.00 to 13.50
No. 1 yard wrought.....	11.00 to 11.50
Wrought pipe (1-in. in diam., over 2 ft. long).....	9.50 to 10.00
Machine shop turnings.....	10.00 to 10.50
Cast iron borings, rolling mill.....	12.00 to 12.50
Cast iron borings, chemical.....	16.00 to 16.50
Blast furnace borings and turnings.....	10.50 to 11.00
Bundled forged scrap.....	11.00 to 11.50
Regular forged scrap and bundled skeleton.....	9.50 to 10.00
Axles.....	20.00 to 20.50
Shafting.....	19.50 to 20.00
Rails for rolling.....	15.00 to 15.50

## Cincinnati

### Southern Pig Iron Obtainable at \$22.50—Advances by Some Sellers Check Buying

CINCINNATI, Dec. 12.—The pig iron market continues active as far as inquiries are concerned, but advancing of asking prices has for the time being, at least, held up the closing of some of those outstanding. Nevertheless a fair amount of orders is being booked for first quarter delivery. An Indiana malleable shop bought 500 tons of malleable, a Michigan stove manufacturer 1000 tons of Southern, and a Cincinnati melter 500 tons of Southern foundry. These were the largest sales reported, but in addition a number running from 100 to 400 tons were made. Southern iron is now available from one furnace at \$22.50, Birmingham, and resale material is said to have been sold at slightly under this figure. The general quotation, however, is \$23, with one or two of the larger producers holding for \$25. The Tennessee company is reported to be an active solicitor for business at \$23, base. In the North, prices are very much firmer following recent heavy selling. Some southern Ohio furnaces are now asking \$27.50 on prompt shipment material, and \$28 on first quarter contracts, but iron can still be had at \$27 for a round tonnage. Silveries and basic irons are rather quiet, and carload sales of the former grade represent present activity. Inquiries include 3600 tons of malleable for Indianapolis, 2000 tons of foundry for Michigan, 1000 tons of foundry for central Ohio, 1000 tons for Indianapolis, 500 for Cincinnati, 500 for Richmond and 500 for

Louisville. In addition a large number of smaller inquiries are being worked on, the total representing a very satisfactory tonnage.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton, we quote f.o.b. Cincinnati:  
 Southern coke, sil. 1.75 to 2.25 (base).....\$26.55  
 Southern coke, sil. 2.25 to 2.75 (No. 2 soft).....27.05  
 Ohio silvery (nominal), 8 per cent.....37.77  
 Southern Ohio coke, sil. 1.75 to 2.25 (No. 2).....29.27  
 Basic Northern.....28.27  
 Malleable.....29.27

**Warehouse Business.**—The demand for structural shapes show no sign of letting up, and during the week some good orders were placed. Inquiries from Southern points are very good, and quick shipment material is much in demand. Reinforcing bars are also in fair demand. Wire products are moving much better than has been the case for some time. Prices are holding up strongly, but no changes have been made.

Cincinnati jobbers quote: Iron and steel bars, 2.95c. base; reinforcing bars, 3.05c. base; hoops, 4.05c. base; bands, 3.85c. base; shapes and plates, 3.05c. base; cold-rolled rounds, 3.75c. base; cold-rolled flats, squares and hexagons, 4.25c. base; No. 10 blue annealed sheets, 4c.; No. 28 black sheets, 4.70c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, \$3.10 per 100 lb.; common wire nails, \$3.20 per keg, base.

**Tool Steel.**—The demand for high-speed steel is entirely satisfactory to the producers, and some fair-sized orders have been placed for December shipment. The outlook is very promising. Prices are firm, with 18 per cent tungsten high-speed steel quoted at 75c. to 90c., with special brands of some companies as high as \$1.00.

**Finished Material.**—The demand for bars, shapes and plates, in small lots, is fair, although during the latter part of the week even this business showed a slight falling off. To date very little business has been booked for first quarter, although a number of the independent companies are making contracts on the basis of 2c. for bars, shapes and plates. Deliveries on plates are falling behind, as from practically all mills four to five weeks is the best delivery promise, whereas in November it was possible to secure two to three weeks' delivery. The sheet market is rather quiet, due just as much to the attitude of the mills as to the lethargy of buyers. Independent mills are not pushing sales of galvanized sheets, and some of them are booking only at the insistence of regular customers. High prices of spelter are given as the reason why independent mills can not produce galvanized sheets profitably at 4.35c. Pickled specialties are in good demand, and some good orders for automobile body sheets have been placed for January and February delivery. The minimum price on auto body stock is 5c. and this price probably will prevail for the first quarter at least. Wire mills report the demand picking up steadily, with shipments also improving. Prices are very firm, and on wire nails \$2.75 is being done regularly by an independent mill which can make almost immediate shipment. The demand for reinforcing bars has fallen off with the lateness of the season for building purposes, although a large number of small projects are still under way, and many more, small and large, will be up for figures about Jan. 1. In the structural field, chief interest centered in the buildings for the American Rolling Mill Co. at Ashland, Ky., involving 4000 tons. Bids were taken on Dec. 5 and the contract has been awarded to the Fort Pitt Bridge Co. and McMyler Interstate Co. The Mengel Body Co., Louisville, Ky., has awarded the steel for its new plant to the Louisville Bridge & Iron Co., which is inquiring for 400 tons of shapes to cover the contract. The L. & N. Railway has taken bids on a bridge in Louisiana, involving several hundred tons, and award will likely be made this week.

**Coke.**—There is little activity in prompt shipment coke, but by-product ovens are contracting for next year, the price to be based on present coal prices. Some contracts have already been made on this basis, one of 7200 tons being the largest. Coke prices show little change, but, if anything, the market is lower. Sales have been light. Car shortage is reported in West Virginian and Southern producing points.

**Old Material.**—The scrap market is quiet, though we note a sale of a fairly heavy tonnage of steel to an



Ashland plant at around \$18.50 delivered. Orders are confined to one or two carloads. Prices are soft, and most items have been reduced 50c. a ton.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets	\$13.00 to \$13.50
Iron rails	16.00 to 17.00
Relaying rails, 50 lb. and up	25.50 to 26.00
Rails for rolling	17.00 to 17.50
Heavy melting steel	16.00 to 17.00
Steel rails for melting	15.00 to 16.00
Car wheels	19.00 to 19.50

Per Net Ton	
No. 1 railroad wrought	14.00 to 14.50
Cast borings	11.00 to 11.50
Steel turnings	10.50 to 11.00
Railroad cast	16.50 to 17.50
No. 1 machinery	20.50 to 21.00
Burnt scrap	11.00 to 11.50
Iron axles	20.00 to 20.50
Locomotive tires (smooth inside)	13.50 to 14.50
Pipes and flues	10.00 to 10.50

## Buffalo

### Recent Heavy Buying of Pig Iron—Some Sellers Advance Quotations

BUFFALO, Dec. 12.—Exclusive of the tonnage of pig iron purchased by the American Radiator Co. for use in its Buffalo plant, it is estimated that more than 100,000 tons of various grades of foundry iron have been sold here in the last 10 days. The greater portion of this buying is coincident with the radiator purchase. Apparently other buyers were influenced by the action of radiator interests in showing that they were ready to buy. Some of the radiator business, it is understood, went under \$25. Two furnaces which have booked sufficient tonnage for first quarter delivery announce their base price is \$26 and that the differential of \$1 is in effect. Another producer who did not take any of the tonnages offered announces \$26 as the base. Malleable is also quoted at \$26 by some sellers. A few scattered sales at \$24.50 base were made while the big buying was going on. Generally the furnaces are optimistic; they consider a seller's market is close at hand and that the continued weakening has been stopped.

We quote f.o.b. per gross ton Buffalo as follows, the higher price being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.	\$26.00
No. 2X foundry, 2.25 to 2.75 sil.	25.50
No. 2 plain, 1.75 to 2.25 sil.	25.00
Basic	26.00
Malleable	25.00
Lake Superior charcoal	36.28

**Finished Iron and Steel.**—Bar and sheet business has taken a more lively turn and several sellers have booked considerable new business for first quarter. Reports of prices lower than 2c. on bars continue, but Buffalo sellers uniformly claim these have not been made in this district, though 1.90c. and 1.95c. may have been quoted elsewhere. Plates and structural shapes were purchased more freely in the last few days than previously, and in lots of several hundred tons and up. A number of 100 to 300-ton lots of bars were booked. Local information is to the effect that the Steel Corporation has sufficient business booked for the next five months and one local bar seller has his books filled up to the end of February. That Feb. 1 will see a sellers' market is the prediction by a majority of producers. Inquiry for wire rods is more lively. In sheet demand the price at 3.35c. for No. 28 gage black is firm and on this basis the local sheet maker has taken several thousand tons in both common sheets and specialties; this week is expected to bring sufficient demand at this price to warrant closing the books for first quarter. Structural jobs in lots of less than 100 tons have been encouraging.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.20c.; plates, 3.20c.; soft steel bars, 3.10c.; hoops, 4.10c.; bands, 3.90c.; blue annealed sheets, No. 10 gage, 4.05c.; galvanized steel sheets, No. 28 gage, 5.85c.; black sheets, No. 28, 4.85c.; cold rolled round shafting, 3.95c.

**Old Material.**—Very little new business has developed and the tendency to keep down inventories is more pronounced as the first of the new year ap-

proaches. Two mills which consume large quantities of heavy melting steel have held up shipments for this reason. Inquiry is encouraging. Neither dealers nor consumers have large stocks on hand and the fact that after Jan. 1 there will be greater activity tends to the belief that lower prices on scrap are remote. Railroad malleable is scarce and inquiry is good. Cast scrap is active and borings and turnings in good demand. The market for heavy melting steel is \$19 to \$19.50.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	\$19.00 to \$19.50
Low phos., 0.04 and under	21.00 to 22.00
No. 1 railroad wrought	18.00 to 19.00
Car wheels	21.00 to 22.00
Machine-shop turnings	14.50 to 15.50
Cast iron borings	16.00 to 16.50
Heavy axle turnings	17.50 to 18.50
Grate bars	16.00 to 17.00
No. 1 busheling	16.50 to 17.50
Stove plate	17.00 to 18.00
Bundled sheet stampings	14.00 to 15.00
No. 1 machinery cast	20.00 to 21.00
Hydraulic compressed	17.00 to 17.50
Railroad malleable	20.50 to 21.50

## St. Louis

### Heavy Sales of Northern Pig Iron—Railroads Buy Plates

ST. LOUIS, Dec. 12.—A heavy volume of sales of northern pig iron during the last week has made the market firm at \$28, Chicago, with the St. Louis Coke & Chemical Co. quoting \$29 to \$30, f.o.b. Granite City furnace. The latter concern reports the sale of more than 20,000 tons of malleable, foundry and basic iron during the week. Some of this was requested for immediate shipment, with a liberal portion for delivery over the first quarter. Other sales reported include: 3000 tons and 6000 tons of foundry iron to two Illinois melters; 2000 tons of foundry iron to Indiana and Ohio points; 1000 tons to a Kansas melter, and 800 tons of malleable to an Illinois concern. An Indianapolis melter wants 3000 tons of malleable for January and February delivery, and there are other inquiries for about 20,000 tons of Northern iron pending. The market for Southern iron is at \$23, Birmingham, with very little interest shown. One leading maker is still quoting \$25.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Birmingham (rail and water), \$5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25	\$30.16
Northern malleable, sil. 1.75 to 2.25	30.16
Basic	30.16
Southern foundry, 1.75 to 2.25	28.17

**Finished Iron and Steel.**—Chief interest the last week was in railroad business. The Missouri Pacific bought 300 tons of tank plates and 100 tons of fire box plates. The Mobile & Ohio bought a carload of wheels from Midvale Steel & Ordnance Co., and another line centering here purchased 100 tons of axles and 132 tons of locomotive tires. The Missouri Pacific wants 3000 kegs of track bolts. The Mobile & Ohio is in the market for 4500 pairs of angle bars, approximately 160 tons, and the Wabash wants 2000 pairs, approximately 70 tons. Jobbers are buying very little for prompt or first quarter delivery. Fabricators report that there is a slump in new business.

For stock out of warehouse we quote: Soft steel bars, 2.90c. per lb.; iron bars, 2.90c.; structural shapes, 3c.; tank plates, 3c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 3.90c.; structural rivets, 3.85c. per 100 lb.; boiler rivets, 3.95c.; tank rivets,  $\frac{1}{2}$  in. and smaller, 55 per cent off list; machine bolts, large, 50 per cent; smaller, 50 per cent; carriage bolts, large, 45 per cent; small, 45 per cent; lag screws, 55 per cent; hot pressed nuts, square or hexagon blank, \$2.75; and tapped, \$2.75 off list.

**Coke.**—The market for coke for industrial purposes may be said to be weaker. There still is a fairly good demand, but with the improvement of railroad conditions, especially in the East, the movement to this market has been heavier. The local by-product makers report good business.

**Old Material.**—The only interest shown by consumers of old material in this market is in specialties, such as couplers and knuckles, springs and wheels, and there

is already a short interest in these grades. Other buyers are not interested, although dealers expect they will come into the market shortly after the first of the year. The Wabash has out a list of about 1250 tons, about 700 tons consisting of yard scrap. A Louisville & Nashville list closed, with all of the material going to Eastern markets.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$20.00 to \$20.50
Rolls for rolling	16.50 to 17.00
Steel rails less than 3 ft.	19.50 to 20.00
Relaying rails, standard section	26.00 to 29.00
Cast iron car wheels	23.00 to 23.50
Heavy melting steel	16.00 to 16.50
Heavy shoveling steel	15.00 to 15.50
Frogs, switches and guards cut apart	16.00 to 16.50
Per Net Ton	
Heavy axles and tire turnings	11.50 to 12.00
Steel angle bars	16.50 to 17.00
Iron car axles	26.00 to 26.50
Steel car axles	19.00 to 19.50
Wrought iron bars and transoms	21.50 to 22.00
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	15.00 to 15.50
Railroad springs	20.00 to 20.50
Steel couplers and knuckles	20.00 to 20.50
Cast iron borings	10.50 to 11.00
No. 1 bushelling	13.00 to 13.50
No. 1 railroad cast	19.00 to 19.50
No. 1 machinery cast	20.00 to 20.50
Railroad malleable	18.00 to 18.50
Machine shop turnings	9.50 to 10.00

## Cleveland

### Heavy Selling in Territory Outside the City— Price Advances by Some Companies

CLEVELAND, Dec. 12.—Ore on Lake Erie docks at the close of the season of navigation, Dec. 1, amounted to 9,899,313 gross tons as compared with 9,032,595 tons on the same date a year ago and with 10,955,868 tons on Dec. 1, 1920. Receipts at Lake Erie ports during the season were 31,713,645 tons as compared with 15,554,341 tons during 1921. Shipments from these docks for the season were 21,095,473 tons as compared with 12,195,679 tons during the previous year. Receipts at other than Lake Erie ports during the season were 10,483,888 tons as compared with 6,560,139 tons during the previous year. By ports these receipts were as follows: Detroit, 809,230 tons; Indiana Harbor, 1,124,170 tons; Gary, 2,894,447 tons; South Chicago, 5,010,308 tons; Milwaukee, 27,040 tons; Boyne City, 3,695 tons; East Jordan, 17,873 tons; Saulte St. Marie, Ont., 291,456 tons; Point Edward, Ont., 305,669 tons. Receipts at lake front furnaces located at Lake Erie ports to Dec. 1 were 8,507,194 tons as compared with 2,712,433 tons last year. Shipments from Lake Erie ports for the season till Dec. 1 were 21,095,473 tons.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, \$5.95; Old range non-Bessemer, 51½ per cent iron, \$5.20; Mesabi Bessemer, 55 per cent iron, \$5.70; Mesabi non-Bessemer, 51½ per cent iron, \$5.05.

**Pig Iron.**—Pig iron sales continued heavy in foundry and malleable grades during the week and two producers, who have been particularly active in the market having taken all of the business that they cared for at the prices they were naming, have marked up their quotations. Others to meet the prevailing competitive situation have reduced their prices. Sales by Cleveland producers during the past ten days since the buying movement started, including business taken by Lake, Detroit and Valley and Pittsburgh district furnaces, aggregated 250,000 to 300,000 tons. The greatest activity was in the Michigan territory, but considerable business has come out in the northern Ohio territory and also in the Pittsburgh district. Buying in Cleveland has been light. The market is still fairly active, although buying has quieted down somewhat. Most producers have confined their sales to the first quarter although one or two furnaces have taken some contracts for the entire first half. While probably the heaviest buying has been done by the automotive industry, a large tonnage has been booked in other fields. A sanitary interest has been a heavy buyer. The demand for malleable iron has been particularly heavy, one maker selling nearly as much of this grade

as foundry iron. Foundry iron is being quoted at \$25 Cleveland for shipment to competitive points and a Cleveland producer is naming \$25 Valley for shipment from a western Pennsylvania furnace. However, \$26 appears to be the more common local price for outside shipment, a number of sales being made at that price. One Valley furnace advanced its price from \$25 to \$26 during the week, but continued to take business, and made another advance to \$27, virtually withdrawing from the market. A Detroit producer which advanced its price to \$27 a week ago has made some sales at that price. Another producer that has been active in the Detroit territory has now advanced its price \$1 a ton to a \$27 minimum basis and has sold 15,000 tons at the advance. A local interest reports sales in the Pittsburgh district aggregating 10,000 tons. For Cleveland delivery, local producers are quoting malleable and foundry, \$26 to \$26.50, furnace, a decline of 50c. to \$1 during the week. The Westinghouse Electric & Mfg. Co. has purchased 900 tons for its Cleveland plant, this business apparently going to a Valley producer. The same company bought 1100 tons for its Trafford City, Pa., plant from a Cleveland interest. The Fanner Mfg. Co., Cleveland, purchased 1000 tons of special malleable iron running low in manganese from an outside furnace. One Mansfield, Ohio, consumer purchased 1000 tons of foundry iron and another 500 tons. One Michigan foundry bought 9000 tons of malleable and foundry iron and another consumer 5000 tons of malleable. An Ohio malleable foundry purchased 4000 tons and is negotiating for 4000 tons additional. The General Electric & Mfg. Co. has sent out a number of inquiries for various grades of pig iron. Sales of Southern iron aggregating 2000 tons in small lots are reported in this territory, mostly for the first quarter. One producer, after taking some business at \$22, marked up its price to \$22.50, and later in the week to \$23, which now appears to be a minimum quotation. A sanitary interest is inquiring for its Southern iron requirements for the first quarter, estimated at 10,000 tons. A central Ohio consumer is inquiring for round tonnage of basic iron.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron includes a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and a \$6 rate from Birmingham.

Basic, Valley furnace (nominal)	\$25.00
Northern No. 2 fdy., sil. 1.75 to 2.25	\$26.50 to 27.00
Southern fdy., sil. 1.75 to 2.25	29.00
Malleable	27.00
Ohio silvery, nominal, sil. 8 per cent	38.52
Standard low phos., Valley furnace	36.00

**Semi-Finished Steel.**—The leading local producer has met the Carnegie Steel Co.'s price of \$36.50 on sheet bars and is naming the same price for slabs and billets. During the week this interest sold several lots aggregating 15,000 to 20,000 tons, mostly in sheet bars, largely for December and January delivery, but in some cases for first quarter shipment. Forging billets are easier, a local inquiry for 200 tons bringing out a \$42.50 quotation.

**Sheets.**—Some independent mills are still shading black sheets \$2 a ton to 3.25c., but blue annealed and galvanized sheets are firm at the American Sheet & Tin Plate Co. schedule, and some mills are holding to 2.60c. for the former. Some mills that started to take sheet contracts only for January delivery are now closing contracts for the first quarter at the regular schedule.

**Reinforcing Bars.**—With the falling off of the building work, the demand has quieted down. A round lot will be required for the United Brethren Publishing Co. Building, Dayton, Ohio, and 100 tons for the Kentucky Baptist Hospital, Louisville, Ky. Prices on hard steel reinforcing bars remain unchanged at from 1.95c. to 2c.

**Bolts, Nuts and Rivets.**—Many consumers of bolts and nuts are placing first quarter contracts at present prices, which appear firm. Buyers, however, are not taking much chance against the market decline for manufacturers usually revise prices on existing contracts in case the market is established at lower levels. Rivet manufacturers are booking some first quarter contracts at the prevailing prices of 3c. for structural and 3.10c. for boiler rivet. Rivet specifications are light, due evidently to the approaching inventory time.

**Finished Material.**—The market on steel bars, plates



and structural material has become firmer, this being particularly true of plates, which have been weaker than the other two items. Some of the plate mills have increased the tonnage on their books and are not making the price concessions that appeared during the previous week or two. A sale of 2000 tons of plates to an Erie, Pa., boiler shop is reported at 1.95c., but some mills are not quoting below 2c. The Toledo Ship Building Co. has placed 3000 tons of plates with the leading interest for a lake boat for which it recently took a contract. A Sharon, Pa., shop has placed 1000 tons of plates for oil refinery work, most of the order going to a Youngstown mill. A Youngstown shop has placed 1500 tons of plates with a Youngstown mill for oil tank work. Steel bars are firm, there being little evidence now of any shading of the 2c. price. Structural material is commonly quoted at 2c. The volume of new business is holding up well. While not many consumers are placing contracts for the first quarter, many are buying steel for their requirements extending well into that quarter. Orders were placed by two or three local bar consumers during the week for approximately 2000 tons of steel bars for January shipment. In the automobile field some orders are being placed for spring and rim steel for January shipment. Building construction work has fallen off considerably, but a fair volume of work is in prospect, which is expected to come out early in the year.

Jobbers quote steel bars, 2.91c.; plates and structural shapes, 3.01c.; No. 9 galvanized wire, 3.30c.; No. 9 annealed wire, 2.80c.; No. 28 black sheets, 4.35c. to 4.40c.; No. 28 galvanized sheets, 5c. to 5.40c.; No. 10 blue annealed sheets, 3.70c. to 3.76c.; hoops and bands, 3.71c.; cold-rolled rounds, 3.75c.; flats, squares and hexagons, 4.25c.

**Coke.**—Standard Connellsville foundry coke is now being quoted as low as \$7.75, but most producers are asking from \$8 to \$8.50. The only activity is in small lots.

**Old Material.**—The American Steel & Wire Co. came into the market during the week for heavy melting steel for its Cleveland works and is understood to have purchased 5000 to 6000 tons from a local dealer at \$19 to \$19.50 delivered, and another local mill in the market for machine shop turnings for which it is offering \$15.50 and has bought some at that price. A local briquetting plant has resumed operations and is buying turnings. Valley district mills are doing some quiet buying in small lots for deliveries extending over 45 to 60 days. The market is fairly firm and prices have advanced 25c. a ton on turnings and mixed borings. Dealers are behind on shipments because of the car shortage and some of the mills are crowding for deliveries. Other have held up shipments.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel.....	\$18.25 to \$18.50
Steel rails under 3 ft.....	19.75 to 20.00
Steel rails for rolling.....	20.00 to 20.50
Iron rails.....	18.00 to 18.50
Iron car axles.....	25.00 to 26.00
Low phosphorus melting.....	20.00 to 20.50
Cast borings.....	15.75 to 16.00
Machine shop turnings.....	14.75 to 15.00
Mixed borings and short turnings.....	15.75 to 16.00
Compressed steel.....	16.50 to 16.75
Railroad wrought.....	17.00 to 17.50
Railroad malleable.....	20.00 to 20.50
Light bundled sheet stampings.....	13.00 to 13.50
Steel axle turnings.....	16.00 to 16.50
No. 1 cast.....	20.50 to 21.00
No. 1 busheling.....	12.50 to 13.50
Drop forge flashings over 10 in.....	12.75 to 13.25
Drop forge flashings under 10 in.....	12.50 to 13.50
Railroad grate bars.....	17.00 to 17.50
Stove plate.....	17.00 to 17.50
Pipes and flues.....	13.00 to 13.75

An open competitive examination for master electrician to fill a vacancy at the Navy Yard, Brooklyn, N. Y., at a salary of \$12.96 per day, duties involving the executive management and direction of an electrical shop employing about 300 men, has been announced by the United States Civil Service Commission, Washington, to which application should be made for the requisite blanks.

E. D. Garfield, resident manager of Manning, Maxwell & Moore, Inc., Milwaukee, Wis., has opened an office in the Palace Theatre Building in that city.

## Philadelphia

### Pennsylvania Railroad Buys Several Thousand Tons of Plates at 1.90c.

PHILADELPHIA, Dec. 12.—The noteworthy developments in the local market within a week have been the definite settling of the plate price on large tonnages to 1.90c., Pittsburgh, and a gradual broadening of the demand for pig iron. In general, the steel market is quiet, as is to be expected in the last month of the year, but a fair volume of business in small tonnages is being put on mill books and the mills are encouraged to believe that larger buying will come soon after the turn of the year. This view is borne out partially, at least, by the reports which steel salesmen bring in from their customers.

**Pig Iron.**—Users of foundry iron in increasing numbers are covering their requirements for first quarter in whole or in part and there is a distinctly better tone in the eastern Pennsylvania pig iron market despite the fact that some furnaces have made slight concessions in an effort to close business during the past week. The withdrawal of some \$25 quotations by Buffalo furnaces has made it easier for eastern Pennsylvania furnaces to compete for business in New England without going below \$27, base, furnace, and this has imparted a healthier tone to the situation in this district. It would be stretching a point to say that pig iron prices are firmer, but at least it can be said that a larger number of orders is being taken at prices above \$27, base. One furnace company which has a well-filled order book has announced that it will not consider business below \$28, base, furnace. The largest foundry iron orders of the week were placed by the Westinghouse Electric & Mfg. Co. for its Essington plant, totaling about 2500 tons. The business was divided among three of four furnaces and the approximate delivered prices were \$27.76 for No. 2 plain and \$28.76 for No. 2X. There is a tendency among furnaces to equalize freight rates, thus meeting the competition of the furnace having the lowest rate to point of destination. The reduced prices quoted in the table below are in line with this tendency and do not imply a reduction in price at the furnace except in special instances. On an order for about 400 tons of No. 1X a furnace made a price of \$28.50 furnace. Lower prices are in effect on foreign iron, as some sellers are attempting to unload the stocks which they have been obliged to put in storage. Consumers are not so anxious to take foreign iron now that domestic grades are easily obtainable. Last week's receipts from abroad show a sharp decline from the previous week, but several good-sized cargoes are expected next week. The total for the week ended Dec. 16 was 5000 tons, divided as follows: England, 2340; Scotland, 2006; France, 500; Belgium, 154.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to \$1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.....	\$27.76 to \$28.14
East. Pa. No. 2X, 2.25 to 2.75 sil.....	28.76 to 29.14
East. Pa. No. 1X.....	29.76 to 30.14
Virginia No. 2 plain, 1.75 to 2.25 sil.....	33.17 to 34.17
Virginia No. 2X, 2.25 to 2.75 sil.....	34.17 to 35.17
Basic delivered eastern Pa.....	27.50 to 28.00
Gray forge.....	28.14 to 28.64
Malleable.....	30.64 to 31.64
Standard low phos. (f.o.b. furnace).....	35.00
Copper bearing low phos. (f.o.b. furnace).....	32.00 to 35.00

**Ore.**—Receipts of iron ore last week totaled 7839 tons, all from Sweden.

**Ferroalloys.**—Demand for ferromanganese has fallen off in the past week. Prices are unchanged at \$100, furnace, for domestic and \$100, seaboard, duty paid, for the imported. Spiegeleisen is offered at \$37, furnace, or less. A shipment of 250 tons of spiegeleisen was received from England at this port last week.

**Coke.**—The Keystone Coal & Coke Co. has announced that it will take contracts for foundry coke

for first quarter at \$8.50, ovens, and at \$7.50 for first half or the entire year.

**Semi-Finished Steel.**—Sales of open hearth re-rolling billets have been made at \$38, Pittsburgh, and forging billets at \$42.50, Pittsburgh.

**Plates.**—The Pennsylvania Railroad has divided orders for 6000 to 8000 tons of car plates for immediate rolling among three or four mills, and the price paid is reported to be equivalent to 1.90c., Pittsburgh, though quotations were made in each instance on a mill basis. The plate market has been weak for some time, but concessions have been made with a good deal of secrecy. Now, however, mills are openly quoting 1.95c., Pittsburgh, on ordinary lots and 1.90c. is freely quoted when the tonnage is attractive. It is only on small lots that 2c., Pittsburgh, is obtainable. Quotations of 1.85c., Pittsburgh, are said to have been made and even 1.80c. has been mentioned, but there is no definite information that sales have been made at these low levels. Plate mills are operating mostly on single turn, and the aggregate tonnage booked in the past two weeks has not been sufficient to sustain the recent rate of operation; in fact, the tendency has been somewhat the other way.

**Structural Material.**—More is heard of slight price concessions on structural shapes, but apparently there are no quotations below 1.95c., Pittsburgh. The volume of business has shrunk slightly, which is to be expected at this time of year, and current orders are mostly for small lots for early rolling. The going price on small-lot business is 2c., Pittsburgh.

**Bars.**—Steel bars are firm at 2c., Pittsburgh, and most of the mills are in a comfortable position. Current business is in small volume, but business on mill books is sufficient in most instances for 60 to 90 days. There is less talk of concessions on bar iron, which is quoted at 2c., Pittsburgh.

**Sheets.**—While most of the small orders for blue annealed are at 2.60c., Pittsburgh, larger lots are obtainable at 2.50c. Black sheets are quoted by most mills at 3.35c. and galvanized at 4.35c., Pittsburgh, with some mills uninterested in orders for galvanized sheets, which they say represent a loss at current selling prices.

**Warehouse Business.**—Orders for steel out of stock have picked up in the past week. Apparently consumers are filling some of their immediate needs from warehouse stocks rather than buy in larger quantities

from mills just prior to inventory. We quote warehouse prices for local delivery as follows:

Soft steel bars and small shapes, 3c.; iron bars (except bands), 3c.; round edge iron, 3.20c.; round edge steel, iron finish,  $1\frac{1}{2} \times \frac{1}{2}$  in., 3.20c.; round edge steel planished, 4c.; tank steel plates,  $\frac{1}{4}$ -in. and heavier, 3.10c.; tank steel plates,  $\frac{3}{8}$ -in., 3.33c.; blue annealed steel sheets, No. 10 gage, 3.85c.; black sheets, No. 28 gage, 4.60c.; galvanized sheets, No. 28 gage, 5.75c.; square twisted and deformed steel bars, 3.15c.; structural shapes, 3.10c.; diamond pattern plates,  $\frac{1}{4}$ -in., 4.80c.;  $\frac{3}{8}$ -in., 5c.; spring steel, 4.25c.; round cold-rolled steel, 3.85c.; squares and hexagons, cold-rolled steel, 4.35c.; steel hoops, No. 13 gage and lighter, 4.25c.; steel bands, No. 12 gage to  $\frac{3}{8}$ -in., inclusive, 3.825c.; rails, 3c.; tool steel, 8.50c.; Norway iron, 6.50c.

**Old Material.**—Current price quotations on various grades of old material represent all that can be obtained by those who are in a position where they must sell, but if consumers were to come in the market for substantial tonnages, it would be difficult, and probably impossible, for them to cover at the prices which are being paid on the small lots now being sold. Dealers are not willing to sell "short" at present levels because of the fear that they would be unable to cover at a profit. The tendency of dealers with yard stocks is to hold for higher prices, which the trade believes will come in January.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel.....	\$16.00 to \$16.50
Scrap rails .....	16.00 to 16.50
Steel rails for rolling.....	19.50 to 20.00
No. 1 low phos., heavy 0.04 and under .....	22.00 to 23.00
Cast iron car wheels.....	20.00 to 21.00
No. 1 railroad wrought.....	19.00 to 20.00
No. 1 yard wrought.....	17.00 to 17.50
No. 1 forge fire.....	15.00 to 15.50
Bundled sheets (for steel works) .....	14.50 to 15.00
No. 1 busheling.....	14.50 to 15.00
Turnings (short shoveling grade for blast furnace use).....	14.50 to 15.00
Mixed borings and turnings (for blast furnace use).....	14.50 to 15.00
Machine shop turnings (for steel works use) .....	15.00 to 15.50
Machine shop turnings (for rolling mill use).....	15.00 to 15.50
Heavy axle turnings (or equivalent) .....	15.00 to 15.50
Cast borings (for steel works and rolling mills).....	15.00 to 16.00
Cast borings (for chemical plants) .....	20.00 to 22.00
No. 1 cast.....	20.00 to 21.00
Heavy breakable cast (for steel plants) .....	19.00 to 19.50
Railroad grate bars.....	16.50 to 17.00
Stove plate (for steel plant use) .....	16.50 to 17.00
Railroad malleable .....	15.50 to 16.50
Wrought iron and soft steel pipes and tubes (new specifications) .....	14.50
Shafting .....	21.00 to 22.00
Steel axles .....	22.00

engine stops, turbine blowers, Enco oil burners, steam purifiers and gas producers.

#### Coal and Ash Handling

Diagrams and models of Riley and Jones underfeed stokers, and Murphy automatic furnaces were at the booth of the Sanford Riley Stoker Co., Worcester, Mass. A heavy duty Coxe stoker was shown by the International Combustion Engineering Corporation, New York, a model of the Green stoker in operation being also on view. A Quinn fuel oil burning unit complete connected to a furnace, the Lopulco pulverized fuel burner were among other of the several exhibits. Models of the Huber hand stoker were displayed by the Flynn & Emrich Co., Baltimore, chain grate stokers by the Green Engineering Co., East Chicago, Ind., also Seallex arches and Green cast iron hoppers, and the improved Files hand stoker, was shown by the Gibby Engineering Co., East Boston, Mass. The United Machine & Mfg. Co., Canton, Ohio, exhibited grate sections of the Harrington traveling-grate stoker, and data on its Industrial underfeed stoker and the Mosher desaturator.

An interesting exhibit was that of the R. H. Beaumont Co., Inc., Philadelphia, showing a model of a super-central coal handling installation in operation. A new style electric telescopic hoist was shown by Gillis & Geoghegan, New York, in addition to other manual and electric ash removal equipment. Coal and ash handling machinery were shown by the C. W. Hunt Co., West New Brighton, N. Y. and steam jet ash conveyors by the M. H. Detrick Co., Chicago, improved Detrick flat suspended arches being also featured. The Victor Engineering Co., Philadelphia, showed ash conveying equipment of the steam jet type, and also Carrick combustion control, damper and forced draft regulator. Ash hoppers and gates were shown by Allen-Sherman-Hoff Co., Philadelphia.

#### Water Handling Equipment

The exhibit of the H. S. B. W. Cochrane Corporation, Philadelphia, included a chemical feeding equipment for hot

## POWER EQUIPMENT EXHIBITED

### Boilers, Stokers, Pulverized Coal, Control Apparatus and Other Equipment Shown

The first national exposition of power and mechanical engineering, organized to indicate the progress of the last few years and having exhibits of boilers, stokers, pulverized coal and oil burning equipment, superheaters, control apparatus and a large variety of other material, was held in New York, Dec. 7 to 13. The decision to organize the show resulted from a meeting of representatives of the American Society of Mechanical Engineers, the National Association of Stationary Engineers and the National Electric Light Association. More than 125 companies exhibited. An outline of some of the exhibits follows.

Bethlehem weir feed pumps and a turbo-feed pump, single stage, were shown by the Bethlehem Shipbuilding Corporation, Ltd., Bethlehem, Pa., and various units of the Bethlehem Dahl mechanical oil burning system were on view. An 8-in. single stage pump, a two stage series pump, and a Class C turbine were exhibited by the De Laval Steam Turbine Co., Trenton, N. J. A small high-speed geared turbine was in operation. The Coppus Engineering & Equipment Co., Worcester, exhibited a 20-in. power turbine, boiler feed pumps, and a Vano blower in operation.

Models of its water tube boilers were shown by the George T. Ladd Co., Pittsburgh and a model of its patented water tube boiler, and data on fire tube boilers, by the D. Connelly Boiler Co., Cleveland. Power plant apparatus of the various companies for which it is an agent was exhibited by the Vincent-Gilson Engineering Co., New York. Among these were soot blowers, pumps and ash conveyors, automatic



process water softener, weighing meters and flow meters all of which were shown in operation. Other equipment included a V-notch weir meter and recorder, and a motor controlled multi-port valve in operation. Feed water softeners and filters were shown by the International Filter Co., Chicago, and also chemical mixing, feeding and proportional equipment.

Foster radiant heat and standard type superheaters, and economizers were displayed by the Power Specialty Co., New York. The Davidson Pump Co., New York, exhibited a boiler feed pump and a small working model in operation.

A steam jet with surface inter condenser and after heater in one shell, and a steam jet air pump with jet condenser, were shown by the Wheeler Condenser & Engineering Co., Carteret, N. J. A model of a 5000-kw. General Electric turbine with surface condenser and several auxiliaries was a feature. A model of the company's induced and natural wooden cooling tower was also shown. Evaporators, condensers, heaters, economizers, and tube cleaners were among the exhibits of the Roto Co., Hartford. Feed water regulators, special turbine driven boiler-feed pump governors, and other specialties were exhibited by the S-C Regulator Mfg. Co., Fostoria, Ohio. Its latest type of inter and after condenser Radojet air pumps, Rotrex air pumps, condensate pumps and a dynamometer, were shown by the C. H. Wheeler Mfg. Co., Philadelphia.

The Nash Engineering Co., South Norwalk, Conn., exhibited its Hytor pumps and compressors and a Jennings condensation pump in operation. Reilly feed water heaters, instantaneous heaters, fuel oil heaters, steam and oil separators, and multi-screen filters were included in the large exhibit of the Griscom-Russell Co., New York. Water softeners of the hot press type, were exhibited by the Graver Corporation, East Chicago, Ind.

#### Meters and Control Devices

The Bailey Meter Co., Cleveland, exhibited its boiler meter and multi-pointer gage in connection with a miniature 2 hp. gas fired boiler, and a V-Notch weir meter, both in operation. Other displays included pulverized material feeder and meter, differential gas pressure recorders, and gas meters with pressure compensator. A CO<sub>2</sub> recorder in operation, indicating draft gages, indicating and recording thermometers for flue gas, and other uses, gages for steam pressure and vacuum, were displayed by the Foxboro Co., Inc., Foxboro, Mass. Hays CO<sub>2</sub> and draft recorders in operation, the Hays improved gas analyzer, draft gages and chain-operated water gages, were among the items shown by Paul B. Huyette Co., Philadelphia.

Recording gages, thermometers and tachometers were among the instruments shown by Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y. The Ruggles-Klingemann Mfg. Co., Salem, Mass., displayed its step compensated draft and temperature regulator, and other regulators. Steam meters, low and high pressure gas meters, water meters and flow curves were among the exhibits of the Republic Flow Meters Co., Chicago.

CO<sub>2</sub> recording equipment, draft indicators and recorders, combined barometer and vacuum recorders, and an absolute pressure indicator for condenser service were shown by the Uehling Instrument Co., Paterson, N. J. A feature was the Pyroporous flue gas filter for assuring clean gas for analysis. Tag-Mono recorders for the automatic flue gas analysis, was a feature of the exhibit of the C. J. Tagliabue Mfg. Co., Brooklyn, N. Y. Thermometers, hydrometers, and automatic controllers were among other instruments shown.

Indicating and recording pressure and vacuum gages, dead-weight gage testers, inspectors' testing outfits, and boiler test pumps were among the items shown by the Ashton Valve Co., Boston. A 24-in. double illuminated master pilot gage was a feature. A new cabinet type inclined draft gage, single and double tube; open type inclined draft gage, and the new multi-tube vertical draft gages with movable scale and with equalizer for filling individual chambers simultaneously, were among the exhibits of L. M. Ellison, Chicago.

#### Fire Bricks, Baffles and Arches

A double suspension combustion and ignition arch was shown by the Liptak Fire Brick Arch Co., Minneapolis, and models illustrating the Bernitz method of wall construction, were exhibited by the Bernitz Furnace Appliance Co., Boston. Drake blocks for furnace wall construction were shown by the Drake Non-Clinkering Furnace Block Co., New York, and the American Arch Co., New York, featured its type "P" arch.

The Quigley Furnace Specialties Co., New York, demonstrated the utility of Hytempite, Carbosand and typical applications of Insulbrix. High temperature cements and Mono baffle plates were shown by the King Refractories Co., Inc., New York. Sil-O-Cel heat insulating materials, with models of boilers illustrating the method of bonding were exhibited by the Celite Products Co., New York. Furnace wall supports, intended to increase stoker efficiency, were shown by the Furnace Engineering Co., New York. "Steel

Mixture," a fire cement for boiler settings, with a model boiler showing its use, was exhibited by McLeod & Henry Co., Troy, N. Y.

#### Valves and Fittings

Among a wide variety of valves and fittings the Edward Valve & Mfg. Co., East Chicago, Ind., displayed a new valve with forged steel body and bonnet, monel trimmings for 1100 deg., intermittent temperature.

Reducing valves, and special pressure regulating mechanisms were among the specialties exhibited by the Julian d'Este Co., Boston. A new steam regulator with removable seat and mounting, was also shown. Back pressure valves, lever balanced valves, pressure regulators, pump governors, automatic stop and check valves were displayed by the Foster Engineering Co., Newark, N. J.

In addition to a large display of brass, iron, and steel valves, Jenkins Brothers, New York, showed Mason regulator valves, a new rapid action valve, new air gun valves, new marine valve and their Selco valve. The display of the Lunkenheimer Co., Cincinnati, included steel, bronze, iron and special alloy valves, lubricators, whistles, boiler mountings and other specialties.

Yarnall-Waring Co., Philadelphia, exhibited its tandem blow-off valve, seatless blow-off valve, pipe clamp, boiler skimmer and other devices. Back pressure, balanced tank and relief valves were among those shown by Kieley & Mueller, New York, steam traps, damper regulators, and pump governors being also shown.

Pratt & Cady bronze and iron valves, Reading acid open hearth steel fittings were shown by the Reading Steel Casting Co., Bridgeport. Union bonnet valves, regrinding and a new line for high pressure and high temperature service were shown.

Valves and fittings for all pressures and duties were shown by the Crane Co., Chicago, oil separators, steam traps, pipe bends and other equipment being also shown. Hancock valves and Consolidated safety valves were exhibited by Manning, Maxwell & Moore, New York, Ashcroft gages, Metropolitan injectors and a Reeves automatic stoker control in operation being also featured.

A large exhibit was that of the Walworth Mfg. Co., Boston, which included valves, fittings, pipe tools and the Watts line of power plant specialties and stack heaters. Galvanized amalgamated lead lined iron pipe, fittings and valves were shown by the Lead Lined Iron Pipe Co., Wakefield, Mass.

#### Other Material Exhibited

Thrust bearings for steam turbines were exhibited by the Kingsbury Machine Works, Philadelphia. Steel sections for overhead shafting layouts, and unit air filters were shown by the Midwest Steel & Supply Co., New York. Francke flexible couplings, Keytite self-fitting keys, and Pintite couplings for line shafting made up the exhibit of Smith & Serrell, Newark, N. J. Friction clutches of the Smith type and collar oiling bearings were shown by the Hill Clutch Co., Cleveland and various sizes of friction clutches, and a model of its ball bearing marine reverse gear were exhibited by the Carlyle Johnson Machine Co., Manchester, Conn. A worm gear reducing unit with motor and base was shown in operation by the Philadelphia Gear Works, Philadelphia.

Cast iron pipe made by the De Lavaud centrifugal process, and a section of a barometric condenser, Helander patent, were among the items shown by the U. S. Cast Iron Pipe & Foundry Co., Burlington, N. J.

Oil filtration equipment, oil systems and accessories were shown by S. F. Bowser & Co., Fort Wayne, Ind. The De Laval Separator Co., New York exhibited oil purifiers for fuel and transformer oils.

Waterproof "Speed-Grits," a specialized paper for water rubbing paint materials, is being marketed by the Manning Abrasive Co., Troy, N. Y. It can be used either with oil or dry, where flexibility and toughness are required, and also where exceptional finish is wanted. Although developed primarily for the automobile trade, the new papers are said to be applicable to the finishing of metal furniture, machinery with a highly finished paint surface, typewriters and other products that require many surfacing operations on paint and varnish and where water sanding and rubbing is required. The waterproof Speed Grits are said to be an improvement over pumice on many operations, it being claimed that they cut faster and cleaner and at a lower cost.

Melvin Jameson, for the last 30 years with the Peninsular Stove Co., Detroit, has been appointed general sales manager of the company.

## British Iron and Steel Market

**Foundry Iron Is Easier—Britain to Lay Down Two  
New Battleships at Once—Germany Sells 15,000  
Tons of Rails to Far East at \$24.26 F.O.B.**

(By Cable)

LONDON, ENGLAND, Dec. 12.

Fresh American inquiries have come in for foundry iron and hematite. The pig iron market otherwise is quiet, with foundry grades easier. Hematite is active. Some makers have secured orders covering January to March capacity. Prices are firm.

Demand for finished iron and steel is expanding, more especially from the home trade. The Government has ordered that the two new capital ships [permitted under the Conference on the Limitation of Armaments, to replace four smaller vessels to be discarded later] be laid down by the end of the year. British railroads are placing orders, but the decision has been reached to dissolve the Disposal Board at the end of March, thus releasing large tonnages of second hand material.

Bars, sheets and joists (beams) have been bought for delivery on the Pacific Coast. Exports generally are quiet, though the Chinese demand is improving.

Total pig iron [including ferroalloy] exports for November were 117,708 tons, of which 79,070 tons were consigned to the United States. The total exports of iron and steel for November were 372,332 tons.

Tin plate makers have advanced the minimum quotation of 20s. (\$4.62) basis, f.o.b. Swansea tin plate bars for January to March delivery have advanced 3½s. (87c.). Good business was being done in tin plate before the rise, which now is causing some little confusion.

Galvanized sheets are firm, on moderate demand. The works are well booked up, but there is a possibility that the output will decrease, owing to the tightness of the spelter situation.

Japan is inquiring for black sheets, of the usual specifications, for December shipment, but the works are unable to supply the sheets earlier than February to March.

There has been a fair business in Continental steel recently transacted. German works are now full up to February or March, except for plates. Belgium has sold merchant bars and joists (beams) to India and sheets and wire nails to South America. Germany has sold 15,000 tons of rails to the Far East at £5 5s. (\$24.26) f.o.b. America has bought Continental light and heavy rails.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at \$4.62 per £1, as follows:

Durham coke delivered	£1 8s.	to £1 10s.	\$6.47 to \$6.93
Cleveland No. 1 foundry	4 15½		22.06
Cleveland No. 3 foundry	4 11½		21.14
Cleveland No. 4 foundry	4 7½		20.21
Cleveland No. 4 forge	4 2½		19.06
Cleveland basic	4 0		18.48
East Coast mixed	4 13	to 4 13½	21.48 to 21.60
Ferromanganese	15 0		69.30
Ferromanganese*	14 0		64.68
Rails 60 lb. and up	7 5	to 8 0	33.50 to 36.96
Billets	7 0	to 7 5	32.34 to 33.50
Sheet and tin plate bars, Welsh	7 0	to 7 7½	32.34 to 34.07
Tin plates, base box	1 0	to 1 0½	4.62 to 4.65
C. per Lb.			
Ship plates	8 10	to 9 0	1.75 to 1.86
Boiler plates	11 0	to 11 10	2.27 to 2.37
Tees	9 0	to 9 10	1.86 to 1.96
Channels	8 5	to 8 15	1.70 to 1.80
Beams	8 5	to 8 15	1.70 to 1.80
Round bars, ¾ to 3 in.	9 0	to 9 10	1.86 to 1.96
Galvanized sheets, 24 gage	17 5	to 17 10	3.56 to 3.61
Black sheets, 24 gage	11 15		2.42
Black sheets, Japanese specifications	15 5		3.15
Steel hoops	11 0	& 11 10*	2.27 & 2.37*
Cold rolled steel strip, 20 g.	22 2½		4.56
Cotton ties, Indian specifications	15 0		3.09

\*Export price.

## Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:			
Belgium, Jan., Feb.	£4 10s.		\$20.79
Luxemb'g, Jan., Feb.	4 10		20.79
France, Jan., Feb.	4 10		20.79
Billets:			
France, Jan.	5 0	to £5 15s.	23.10 to 26.57
Luxemburg, Jan.	5 0	to 5 15	23.10 to 26.57
Lorraine, Jan.	5 0	to 5 15	23.10 to 26.57
Wire rods, 5 mm. (0.2 in.):			
Belgium	7 5	to 10 7½	33.50 to 47.93
Wire nails (keg basis):			
Germany	0 14½		3.35
Belgium	0 20½		4.74
Angles:			
Belgium	7 7½		1.52
Tees:			
Belgium	8 5		1.70
Merchant bars:			
Belgium, Feb., Mar.	6 12½	to 6 15	1.37 to 1.39
Luxemb'g, Feb., Mar.	7 0	to 7 2½	1.44 to 1.47
France, Jan., Feb.	7 0	to 7 2½	1.44 to 1.47
Germany, Feb., Mar.	6 10		1.34
Joists (beams):			
France, Jan.	6 5		1.29
Belgium, Jan.	6 0		1.24
Luxemburg, Jan.	6 5		1.29
Channels:			
Belgium	7 10	to 7 12½	1.55 to 1.57
¾-in. plates:			
Germany, Jan., Feb.	6 0	to 6 2½	1.24 to 1.26
Belgium, Jan.	6 10		1.34
Luxemburg, Jan.	6 5		1.29
France, not quoted.			
No. 8 gage wire:			
Belgium	14 10½		3.00

## Proposed Railroad Improvements to Assist Unemployed—Less Pig Iron Demand

LONDON, ENGLAND, Nov. 29.—The election has now come and gone and more hopeful feeling is generally entertained by the business community that the revival in trade will be helped by sane legislation. One of the first problems which are apparently being resolutely grappled with by the government is that of unemployment. The first apparent development of this has been the convening of the various railroad managers of the new leading railroad groups of the country, when proposals were put before them that, to alleviate the present distress caused through unemployment, the railroad companies embark upon a program of further construction. A good deal of this, of course, will consist of renewal work, but it is also proposed that various schemes of electrification of existing lines be carried through, as well as the construction of new small lines connecting up various points of the new group system. It is understood that the schemes will not be financially assisted by the government, but will be carried through from the ample resources of the railroad companies.

A factor which may have considerable bearing on the trade situation generally, and therefore on further alleviating the unemployment question, is the announcement that the railroad rates for certain raw materials are to be reduced from Dec. 1. These materials are coal, coke and patent fuel for blast furnace and steel work.

In the meanwhile the tendency in the Cleveland pig iron market is somewhat easier, at least so far as foundry qualities are concerned. This is, of course, partly a reflection of the diminution in the American demand, but is also attributable to the unfortunate exchange situation with the continent, which seriously hampers export business on the part of this country. It is understood that some sales of foundry iron of special analysis have been made to America for delivery up to March, however, and the general tendency in home consumption is toward improvement. The current quotation for the No. 3 G. M. B. is about 92s.

In finished iron and steel, conditions appear to be slowly but steadily improving. Home consumers have taken rather more interest in the market recently, and steel makers seem to have been receiving a certain amount of shipbuilding orders. Rail makers also are experiencing more business. So far as export trade is concerned, however, conditions have been quieter. It is understood that a Japanese order for locomotives has been booked by Glasgow and other firms, while the Leeds Forge Co. has booked an order for 56 double-deck electric cars for Edinburgh, while Metropolitan-Vickers is understood to have secured a good share of the £4,000,000 of contracts placed in connection with the electrification of South African railroad.



# Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates	
Sheared, tank quality, base, per lb.	1.95c. to 2c.
Structural Material	
Beams, channels, etc.	2.00c.

Iron and Steel Bars	
Soft steel bars, base, per lb.	2.00c.
Refined iron bars, base, per lb.	2.60c.

Hot-Rolled Flats	
Hoops, base, per lb.	2.75c. to 2.90c.
Bands, base, per lb.	2.75c. to 2.90c.
Strips, base, per lb.	2.75c. to 2.90c.

Cold-Finished Steels	
Bars and shafting, base, per lb.	2.50c.
Strips, base, per lb.	4.50c.

Wire Products	
Nails, base, per keg.	\$2.70
Bright plain wire, base, per 100 lb.	2.45
Annealed fence wire, base, per 100 lb.	2.45
Spring wire, base, per 100 lb.	3.25 to 3.35
Galvanized wire, base, per 100 lb.	2.95
Galvanized barbed, base, per 100 lb.	3.35
Galvanized staples, base, per keg.	3.35
Painted barbed wire, base, per 100 lb.	3.00
Polished staples, base, per keg.	3.00
Cement coated nails, base, per count keg.	2.20
Woven fence, carloads (to jobbers)	70 1/2 per cent off list
Woven fence, carloads (to retailers)	68 per cent off list

Bolts and Nuts	
Machine bolts, small, rolled threads...	.60 and 5 per cent off list
Machine bolts, small, cut threads...	.50 and 10 per cent off list
Machine bolts, larger and longer...	.50 and 10 per cent off list
Carriage bolts, 3/4 x 6 in.	
Smaller and shorter, rolled threads.	

Cut threads	50, 10 and 5 per cent off list
Longer and larger sizes	.50 per cent off list
Lag bolts	.60 and 5 per cent off list
Flow bolts, Nos. 1, 2 and 3 heads	.50 and 10 per cent off list
Other style heads	.20 per cent extra
Machine bolts, c.p.c. and t. nuts, 3/4 x 4 in.	
Smaller and shorter	.45 per cent off list
Larger and longer sizes	.45 per cent off list
Hot pressed square or hex. blank nuts	\$.35 to \$.35 off list
Hot pressed nuts, tapped	3.25 to 3.50 off list
C.p.c. and t. sq. or hex. nuts, blank	3.25 to 3.50 off list
C.p.c. and t. sq. or hex. nuts, tapped	3.25 to 3.50 off list
Semi-finished hex. nuts	
9/16 in. and smaller, U. S. S.	.75, 10 and 5 per cent off list
3/4 in. and larger, U. S. S.	.70, 10 and 2 1/2 per cent off list
Small sizes, S. A. E.	.80 and 5 per cent off list
S. A. E., 3/4 in. and larger	.75 and 5 per cent off list
Stove bolts in packages	.80 and 5 per cent off list
Stove bolts in bulk	.80, 5 and 2 1/2 per cent off list
Tire bolts	.50, 10 and 10 per cent off list

Cap and Set Screws	
Milled square and hex. head cap screws	.75 per cent off list
Milled set screws	.75 per cent off list
Upset cap screws	.75 and 10 per cent off list
Upset set screws	.80 per cent off list

Rivets	
Large structural and ship rivets base, per 100 lb.	\$3.00
Large boiler rivets, base, per 100 lb.	3.10
Small rivets	.65 and 10 to 65 and 5 per cent off list

Track Equipment	
Spikes, 9/16 in. and larger, base, per 100 lb.	\$2.75
Spikes, 1/2 in. and smaller, base, per 100 lb.	3.50
Spikes, boat and barge, base, per 100 lb.	3.50
Track bolts, base, per 100 lb.	\$3.75 to 4.50
Tie plates, per 100 lb.	2.35
Angle bars, base, per 100 lb.	2.75

Welded Pipe					
Butt Weld					
Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
1/4	49	23 1/2	1/4 to 3/8	+ 7	+ 33
1/2	55	29 1/2	3/8	26	8
3/4	60	46 1/2	1/2	32	17
1	64	52 1/2	1 to 1 1/2	34	19
1 to 3	66	54 1/2			

Lap Weld	
2	59
2 1/2 to 6	63
7 to 8	60
9 to 12	59

Butt Weld, extra strong, plain ends	
1/4	45
1/2	51
3/4	57
1	62
1 to 1 1/2	64
2 to 3	65

Lap Weld, extra strong, plain ends	
2	57
2 1/2 to 4	61
4 1/2 to 6	60
7 to 8	56
9 to 12	50

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2 1/2 per cent.

Boiler Tubes	
Lap Welded Steel	Charcoal Iron
1 1/2 in.	21 1/2
2 to 2 1/2 in.	36
2 1/2 to 3 in.	47
3 1/2 to 13 in.	52

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes	
Discounts on cold-drawn tubes in carload lots f.o.b. Pittsburgh, follow:	
1 in.	55
1 1/2 and 1 1/2 in.	47
1 1/2 in.	31
2 and 2 1/2 in.	34

Hot Rolled	
3 in.	44
3 1/2 to 4 in.	49

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base	.85 per cent off list
Carbon 0.30 to 0.40, base	.83 per cent off list

Seamless Locomotive and Superheater Tubes	
Cents per Ft.	Cents per Ft.
2-in. O.D. 12 gage	14
2-in. O.D. 11 gage	15
2-in. O.D. 10 gage	16
2 1/2-in. O.D. 12 gage	16
2 1/2-in. O.D. 11 gage	17

Tin Plate	
Standard cokes, per base box	\$4.75

Terne Plate	
(Per package, 200-lb.)	
8-lb. coating	\$9.30
8-lb. coating I. C.	9.60
15-lb. coating I. C.	11.80
20-lb. coating I. C.	13.00

Sheets	
Blue Annealed	
Nos. 9 and 10 (base), per lb.	2.50c.

Box Annealed, One Pass Cold Rolled	
No. 28 (base), per lb.	3.35c.
Regular auto body sheets, base (22 gage), per lb.	4.70c. to 5.00c.

Galvanized	
No. 28 (base), per lb.	4.35c.

Tin-Mill Black Plate	
No. 28 (base), per lb.	3.35c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

## Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic	\$0.325	Buffalo	\$0.265	St. Louis	\$0.43	Pacific Coast	\$1.50
Philadelphia, export	0.235	Cleveland	0.215	Kansas City	0.735	Pac. Coast, ship plates	1.20
Baltimore, domestic	0.315	Cleveland, Youngstown		Kansas City (pipe)	0.705	Birmingham	0.69
Baltimore, export	0.225	Comb.	0.19	St. Paul	0.595	Memphis	0.385
New York, domestic	0.34	Detroit	0.295	Omaha	0.725	Jacksonville, all rail	0.50
New York, export	0.255	Cincinnati	0.295	Omaha (pipe)	0.705	Jacksonville, rail and	
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275	water	0.415
Boston, export	0.255	Chicago	0.34	Denver (pipe)	1.215	New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2 1/2c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

## FABRICATED STEEL BUSINESS

### Awards of 20,000 Tons But New Inquiries, Mostly in West, for Two-Thirds More

Apartment house at Broadway and Eighty-second Street, New York, 1200 tons, to Hay Foundry & Iron Works.

Mechanics & Metals Bank, Fifty-seventh Street, near Seventh Avenue, New York, 300 tons, to Hay Foundry & Iron Works.

Loft building on West Thirty-fourth Street, New York, 400 tons, to George A. Just Co.

Marcus Brown apartment house, New York, 800 to 1000 tons, to A. E. Norton, Inc.

Turbine foundation for Public Service Corporation, Newark, N. J., 400 tons, to Hay Foundry & Iron Works.

Building for Firth Carpet Co., Auburn, N. Y., 100 tons, to Hay Foundry & Iron Works.

School building at New Rochelle, N. Y., 200 tons, to unnamed fabricator.

Building for Lehigh Portland Cement Co., at Birmingham, Ala., 1400 tons, to Bethlehem Steel Bridge Corporation.

Bridges for Chesapeake & Ohio Railroad, 400 tons, to American Bridge Co.

Bridge for New York Central Railroad, 110 tons, to American Bridge Co.

Building for Anaconda Copper Mining Co., 200 tons, to Wisconsin Bridge & Iron Works.

Addition to South Brooklyn Savings Bank, Brooklyn, 200 tons, to Hedden Iron Construction Co.

Apartment house at Lexington Avenue and Eighty-ninth Street, New York, 1250 tons, to Paterson Bridge Co.

Jewish Hospital, Brooklyn, 400 tons, to Paterson Bridge Co.

Public Service Co. of Northern Illinois, power house addition, Joliet, Ill., 2300 tons, to Mississippi Valley Structural Steel Co.

Mengel Body Co., plant addition, Louisville, Ky., 400 tons, to Louisville Bridge & Iron Co.

Southern California Telephone Co., Thornwall office building, Los Angeles, 377 tons, to American Bridge Co.

Missouri Pacific Railroad, turntables, 349 tons, to American Bridge Co.

Illinois Central Railroad, 327-ft., 6-in. through plate girder spans, Simpson, Ill., 309 tons, to American Bridge Co.

LaSalle Street substation, Commonwealth Edison Co., Chicago, 300 tons, to Midland Structural Steel Co.

Byllesby Engineering Corporation, Chicago, two self-

supporting steel stacks, Reinach, Okla., 183 tons, to Minneapolis Steel & Machinery Co.

Northern States Power Co., steel stack, Minneapolis, 120 tons, to Minneapolis Steel & Machinery Co.

Northern Pacific Railroad, Central Avenue bridge, Minneapolis, 115 tons, to American Bridge Co.

National Screw & Tack Co., Cleveland, factory building, to Riverside Bridge Works.

Ashland plant, American Rolling Mill Co., 4000 tons, to Fort Pitt Bridge Co. and McMyler Interstate Co.

Louisville & Nashville Railroad, bridge work, 300 tons, bids taken.

Fair Garage, at Chicago, 150 tons, to Lakeside Bridge & Steel Co., Milwaukee.

Transmission towers for Power Construction Co., Worcester, Mass., 3200 tons, to American Bridge Co.

### Structural Projects Fending

Inquiries for structural steel work now being figured on include the following:

The Greater Northern Railway, 3345 tons of fabricated bridge material for 1923 delivery.

Office building, Albany, N. Y., 125 tons.

Power house, Yale University, New Haven, Conn., 400 tons.

Hotel at Broadway and 100th Street, New York, 1000 tons.

Convention hall at Atlantic City, N. J., 300 tons.

City hospital at Providence, R. I., 500 tons.

Bridge for City of Boston, 400 tons.

Ice plant on Avenue Z, New York, 300 tons.

Apartment house on upper Broadway, New York, 1500 tons.

Highway bridge, Lexington, Mo., 4000 tons, bids taken.

Union League Club building, Chicago, 4000 tons, bids asked.

Roosevelt Road viaduct for Chicago Union Station Co., 4000 tons, bids to be opened this week.

Great Northern Railroad, girders and towers for various locations, 3000 tons, bids taken.

Missouri Pacific, a 200-ft. and a 225-ft. through riveted truss span, 700 tons, bids taken.

Ft. Wayne Corrugated Paper Co., mill at Hartford City, Ind., 150 tons.

Highway bridge, Glasgow, Mo., 1700 tons.

Highway bridge, Waverly, Mo., 2100 tons.

Highway bridge, Yankton, S. D., 3000 tons.

Bridge for City of Spokane, Wash., 2200 tons, bids opened Dec. 3.

Dipper dredge for United States Engineer office, Milwaukee, 200 tons of shapes and plates, bids under consideration.

## RAILROAD EQUIPMENT BUYING

### Fresh Inquiries for 8000 Cars and 90 Locomotives and Purchase of 3000 Cars

The buying by one company of 3000 cars, the appearance of inquiries for 7950 cars and the addition to motive power prospects of 90 locomotives describe the week's developments in railroad equipment buying.

The Baltimore & Ohio Railroad has issued an inquiry for 1000 box cars and will probably buy this week the 2000 hopper cars and 1000 gondolas, for which an inquiry was issued some weeks ago.

The New York Central Railroad has divided an order for 72 passenger coaches among four or five car builders.

The Union Tank Car Co. has placed orders for 3000 tank cars as follows: Standard Steel Car Co., 1000; American Car & Foundry Co., 1000; Cambria Steel Co., 500; General American Car Co., 500.

The United Gas & Improvement Co. is in the market for 150 hopper cars.

The Denver & Rio Grande Western has issued an inquiry for 350 70-ton gondolas and 500 drop bottom stock cars.

The Great Northern is inquiring for 500 75-ton ore cars.

The St. Louis, Troy & Eastern is in the market for 400 gondola cars.

The Southern Pacific has issued inquiries for 1200 gondola cars and 500 logging cars in addition to the 5000 cars reported last week.

The Canadian National Railways are in the market for 2250 box cars, 100 ballast, 100 general service, 100 refrigerator and 800 automobile cars in addition to the 1250 stock, 50 caboose and 50 express refrigerator cars reported a week ago.

The Union Pacific is expected to place 5000 refrigerator cars for the Pacific Fruit Express within a few days.

The Union Pacific is in the market for 73 locomotives of the 2-10-2 type and 5 Mallet engines.

The Chicago & Eastern Illinois contemplates the purchase of 12 additional locomotives of the Pacific and Mikado type.

## California Iron Market

SAN FRANCISCO, Dec. 6.—The pig iron market is quiet at present, so far as actual sales are concerned. There are some indications for 2000 to 3000 tons, but as yet no considerable part has materialized. These offerings, for the most part, are rather lower grade iron than usual, with a high sulphur and phosphorus analysis, and only suited to a few industries on the coast. It is understood prices range from \$26 to \$27, c.i.f., duty for buyers' account. On low silicon iron current prices are from \$29 to \$32, according to grade. Some small volume of business in spot materials has been done, but as foundry demand is rather unsteady and limited, the market does not present many features. Domestic quotations are still too high to make business to the coast inviting.

**Coke.**—This market has been almost uneventful, except for an occasional small sale of a car or two of spot material, and the placing of perhaps 500 tons of foreign coke for December-January shipment. The smelting trade appears to be pretty well stocked for the present. There is no particular change in prices named, the market appearing around \$17, ex ship. The steamer Roman Star has just arrived with 2800 tons of English coke. No business in domestic material is reported.

**Cast Iron Pipe.**—A pre-holiday condition seems to be prevailing along the coast, both in municipal and private business. It is expected, however, that a good volume will be presented after the new year, as many municipalities are contemplating sizable projects. The price remains about steady at \$53 for 6-in., delivered. A recession in the soil pipe market has taken place, the new price being 50 off Birmingham base, compared with 45 off, which was in force.



## NON-FERROUS METALS

### The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits	Lead		Zinc	
	Lake	Electro-lytic*	Tin New York	New York	St. Louis	New York	St. Louis
Dec.							
6.....	14.12½	13.75	37.00	7.30	6.95	7.55	7.20
7.....	14.12½	13.75	37.37½	7.30	6.95	7.65	7.30
8.....	14.12½	13.75	37.50	7.30	6.95	7.60	7.25
9.....	14.12½	13.75	.....	7.27½	6.95	7.60	7.25
11.....	14.12½	13.75	37.25	7.27½	6.95	7.60	7.25
12.....	14.12½	13.75	37.25	7.27½	6.95	7.57½	7.22½

\*Refinery quotation.

### New York

NEW YORK, Dec. 12.

The markets are all very quiet except copper, purchases of which both for domestic and foreign account have been fairly heavy. On most days the tin market has been dull. The lead market is unchanged and the zinc market is exceedingly quiet.

**Copper.**—Demand for electrolytic copper has increased within the past week and sales have been fairly heavy for early and first quarter delivery. Consumers have been picking up all the low priced metal obtainable and the market is now firmly established at 14c., delivered, or 13.75c., refinery. The volume of foreign purchases continues large. Lake copper is quoted at 14.12½c. to 14.25c., delivered.

**Tin.**—The Straits tin market has been largely a dull affair in the last few days. Sales were made on Dec. 7 of about 600 tons, covering November-December and December-January shipments at 37.25c. to 37.50c. Much of this was resale metal, out of town dealers and consumers being the sellers. On Wednesday, Dec. 6, about 250 tons changed hands. Other days, including today, have been dull and slow. Prices in general have advanced, due to higher London prices, with spot Straits tin quoted today at 37.25c., New York. After the statistics were published the London market advanced, but today it had declined quite sharply until prices were about £1 per ton less than those a week ago with spot standard quoted at £175 10s., future standard at £176 15s. and spot Straits at £177 5s. Arrivals thus far this month have been 4010 tons, with the quantity afloat 7428 tons.

**Lead.**—The lead market is quieter but fairly firm. There is no let up in consumption, nor is there much new business being transacted. There has been no change in the quotations of the leading interest, which stand at 6.90c., St. Louis, or 7.10c., New York. Independent producers are quoting 6.95c., St. Louis, and 7.25c. to 7.30c., New York, and are obtaining business at these levels.

**Zinc.**—So far as domestic demand is concerned there has been almost no buying this month. Consumers are covered for December and are awaiting developments as to future needs. The market has been practically under the influence of quotations in London and prices have risen or fallen accordingly, but the actual buying from abroad has not been especially heavy. Prime Western zinc for spot delivery commands the highest prices because of its scarcity but the farther away the future position, the lower the quotation. For 30-day delivery prime Western is quoted at 7.20c. to 7.25c., St. Louis, or 7.65c. to 7.60c., New York. Future positions are about five points per month below these levels.

**Antimony.**—Chinese metal in wholesale lots for early delivery is quoted at 6.35c. to 6.40c., duty paid, New York.

**Aluminum.**—Wholesale lots for early delivery of virgin metal, 98 to 99 per cent pure, are quoted by importers at 22.50c. to 23c. per lb., duty paid, New York, but the leading interest continues to refuse to make public its regular quotation.

**Old Metals.**—Prices are a little higher and business is fairly active. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible.....	13.50
Copper, heavy and wire.....	12.50
Copper, light and bottoms.....	11.25
Heavy machine composition.....	10.25
Brass, heavy .....	8.25
Brass, light .....	6.50
No. 1 red brass or composition turnings..	9.50
No. 1 yellow rod brass turnings.....	8.00
Lead, heavy .....	6.25
Lead, tea .....	5.00
Zinc .....	5.00

### Chicago

DEC. 12.—Copper and lead have declined while tin and zinc have advanced. Buying of copper has been light and confined to immediate requirements. Lead is held rather firmly and another advance by the leading interest would not be surprising although consumptive buying is at a low ebb. Zinc has recovered its recent losses but the market is very dull and users are waiting for another decline. We quote, in carload lots, lake copper, 14.25c.; tin, 38.50c. to 39c.; lead, 7.10c.; spelter, 7.35c.; antimony, 8.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11.50c.; copper bottoms, 9.75c.; red brass, 9c.; yellow brass, 7c.; lead pipe, 5.50c.; zinc, 4.62½c.; pewter, No. 1, 23c.; tin foil, 27c.; block tin, 31c., all buying prices for less than carload lots.

### St. Louis

Dec. 12.—Lead and zinc are 20 points higher than last week. We quote lead, 7c., carlots, and slab zinc, 7.30 to 7.35c. On old metals we quote: Light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; lead, 3c.; pewter, 15c.; tin foil, 20c.; tea lead, 2c., and aluminum, 9c.

### Human Problem in Industry Discussed

Substitution of "the rule of reason and intelligence" for force in an effort to restore in America "the freedom of the individual, be he employer or employee," was urged by E. M. Herr, president of the Westinghouse Electric & Mfg. Co., Pittsburgh, at a joint meeting of the American Society of Mechanical Engineers and the American Economic Association, held in New York Dec. 6.

Mr. Herr advocated a change in the immigration laws, saying: "With industry dependent to such a large extent upon foreign-born workers, the recent immigration laws threaten for lack of 'common' labor, the return to and maintenance of normal production, and it is to be hoped that these laws will be made reasonably liberal and that restrictions will be based on fitness instead of as at present without regard to the immigrant's character or qualification to become an American citizen."

Mr. Herr, whose topic was "The Human Problem in Industry," said that, notwithstanding the popular view, the factory system in the United States was not dominated by the "interests" or "trusts," by far the greater number of manufacturing establishments even now being small. More than 300,000 employees are now working in this country under shop representation plans, he said, and in most cases improved relations between management and employees have resulted, Mr. Herr stated.

Enormous waste flows from labor's fears of layoff or discharge, arbitrary exactions and reductions in wages, unfair discipline and ill-health, he charged, urging as a remedy greater public confidence in the investment in industry. Real wages, he asserted, have advanced, despite the high cost of living. The worker must be made more secure in his job by the employer, said Mr. Herr, who advocated insurance against unemployment from sickness. Unemployment on account of the fluctuation in production because of changes in seasonal demand must, he said, be lessened.

## PERSONAL

W. L. Allen has resigned as vice-president and general manager of Laclede Steel Co., St. Louis, and will be associated after Jan. 1 with Frank H. Johnson, Chicago, in the sale of the Laclede company's products and those of other steel companies. Prior to coming with the Laclede company, Mr. Allen was president of the Valley Steel Co., East St. Louis, Ill., which was taken over by the Laclede Steel Co. in 1918. After leaving college as a metallurgist, he spent several years in the operating departments of blast furnace, open hearth and finishing mill plants, and was one of the early sales engineers of the armor plate department of the Carnegie Steel Co. in the promotion of chrome-vanadium and alloy steels. He later acted as commercial engineer of the R. D. Nuttall Co. in the development of heat treated gearings. His official connection with the Laclede Steel Co. brought him into intimate contact with the manufacture, sale, and use of hot and cold-rolled strip steels. Mr. Allen has had an unusual combination of sales and operating experience.



W. L. ALLEN

John T. Lewis, who has been assistant general superintendent Newburgh works, American Steel & Wire Co., Cleveland, has been promoted to the position of general superintendent Shoenberger works, Pittsburgh, succeeding Charles F. Hill, who several months ago was made general superintendent Newburgh works. Mr. Lewis is succeeded at Newburgh works by B. E. Pheneger, who has been superintendent Central Furnaces, Cleveland.

Colton D. Noble, formerly sales-manager of the North & Judd Mfg. Co., New Britain, Conn., will resume his duties with the company shortly. Mr. Noble left the company in 1918 to go with the M. S. Brooks Co., manufacturer of hooks, brackets, etc., Chester, Conn.

Emil Manweiler, secretary and general manager Eastern Malleable Iron Co., Naugatuck, Conn., has been appointed Aide-de-Camp on Governor-Elect Charles A. Templeton's Staff, of Connecticut.

George Prendergast, for many years district manager in New York for the Lackawanna Steel Co., has established himself in business at 2 Rector Street, New York, as representative of Dilworth Porter, Inc., maker of tie plates and track spikes, and of the Cleveland Frog & Crossing Co.

C. G. Taylor has been appointed director of purchases of the Westinghouse Electric & Mfg. Co., and will have general supervision of the purchasing activities of all plants comprising the electrical group located at East Pittsburgh; East Springfield, Mass.; Newark, N. J.; Mansfield, Ohio; Cleveland; Trafford, Pa.; South Bend, Ind.; Homewood, (Pittsburgh) Pa., and Derry, Pa. Mr. Taylor has been with the Westinghouse company since 1887 and was appointed assistant purchasing agent in 1895, and in 1917 was made purchasing agent. C. G. Bunnell, who has been appointed purchasing agent of the East Pittsburgh works to succeed Mr. Taylor, has been with the Westinghouse company since 1905. For several years he has had charge of machinery and equipment purchases.

George F. Gustafson has been appointed to the sales force of Manning, Maxwell & Moore, Inc., at

Chicago. Until recently he was identified with the Putnam Machine Co., Fitchburg, Mass.

A. N. Pershing and H. F. Bovard have been elected directors of the Keystone Coal & Coke Co., Greensburg, Pa., to fill the vacancies caused by the resignations of Richard C. Coulter and Robert K. Cassatt. Mr. Bovard is vice-president and general manager and Mr. Pershing is vice-president and treasurer of the company.

James E. Frost, general superintendent Alabama Co., Birmingham, Ala., has been appointed operating vice-president and as such will rank next to John W. Porter, who was recently appointed vice-president and general manager, in place of Harry W. Coffin, retired. Mr. Frost is a graduate of Lehigh and has held responsible positions with such companies as the Republic Iron & Steel Co., the Sloss-Sheffield Steel & Iron Co. and the Gulf States Steel Co.

Gordon Lee, chief of the automotive division of the Bureau of Foreign and Domestic Commerce, has resigned. Following his resignation which becomes effective Dec. 15 he will take up the work of directing foreign sales for the Yellow Cab Mfg. Co., Chicago, assuming those duties at the first of the year.

R. J. Rudd, for several years connected with the sales force of the American Hoist & Derrick Co., St. Paul, Minn., and recently with the T. H. Letson Co., 50 Church Street, New York, is now associated in a selling capacity with Philip T. King, 30 Church Street, New York, dealer in used locomotive cranes and other used equipment.

Alfred B. Carhart, vice-president and sales manager Crosby Steam Gate & Valve Co., Boston, and previously for ten years works manager at the Crosby factory of that company, has resigned to become president and general manager of the Precision Instrument Co., 21 Halsey Street, Newark, N. J. He is a mechanical and electrical engineer, a graduate of Princeton University, and before going to Boston was connected with several manufacturing companies in New York.

D. P. Cromwell has been appointed superintendent of the Hubbard blast furnace department of the Youngstown Sheet & Tube Co., Youngstown, Ohio, located at Hubbard, Trumbull County. He succeeds Ernest Evans, transferred to the East Youngstown plant. Mr. Cromwell was formerly located at the company's East Youngstown blast furnaces.

J. F. Kurtz, Jr., for many years associated with the Crucible Steel Co. of America, and for the past seven years assistant general sales agent, has resigned.

J. A. Adamson, formerly district engineer in the New York office of Lockwood, Greene & Co., engineers, has been appointed manager for the New York office of the John W. Ferguson Co., United Bank Building, Paterson, N. J.

E. P. Merrill has been appointed general manager of steel sales for the British Empire Steel Corporation, Ltd., with headquarters at Montreal, Canada. He will also have charge of all steel sales of the corporation's subsidiaries.

T. E. Doremus, who for the past three years has represented E. I. du Pont de Nemours & Co., as general eastern manager for the Orient, with headquarters at Shanghai, China, has returned to the United States. He is now located at Seattle, Wash., where he is manager of the explosives department of the du Pont company.

Paul L. Battey and Alfred R. Kipp have incorporated under the name Battey & Kipp, Inc. Their offices will be located at 123 West Madison Street, Chicago, and their business will consist in general engineering.

T. A. Martin, for many years identified with the George H. Smith Steel Castings Co., Milwaukee, Wis., has become associated with the Farrell-Cheek Steel Foundry Co., Sandusky, Ohio, as general superintendent.

G. S. Rutherford, who has been manager of the Detroit plant of the Solvay Process Co. during the past



year, has been appointed assistant to the president of the company at the home office, Syracuse, N. Y. The change became effective Dec. 1. W. C. Shallcroft, formerly assistant to Mr. Rutherford, has been appointed manager of the Detroit plant.

L. E. Blackburn, who has been connected with the Dupont company for many years on the engineering staff, has been appointed plant engineer for the Olds Motor Works, Lansing, Mich., to succeed Walter S. Kidd, who resigned recently announcing his intentions of engaging in a private enterprise at Wilmington, Del.

## OBITUARY

**WILLIAM B. DEAN**, member of the firm, Nicols, Dean & Gregg, heavy hardware and automotive equipment, St. Paul, Minn., died at his home in that city on Dec. 6. Mr. Dean was born in Pittsburgh in 1838, and when he went to St. Paul at the age of 18 he entered the employ of Nicols & Berkey, successors to the first hardware dealer in the city. Four years later he succeeded Mr. Berkey as partner. His wide range of interests made him prominent in social as well as industrial circles. As a member of the executive committee of the Great Northern Railroad and a director for 22 years, Mr. Dean was a prominent factor in framing the policies of the transcontinental system. He also served in the Minnesota legislature and was a director on many state, local and industrial governing bodies.

**EDWARD L. HUTCHINSON**, manager of the plate department, Moltrup Steel Products Co., Beaver Falls, Pa., died at his home there on Dec. 4. He was born in Allegheny, Pa., 68 years ago and was secretary-treasurer of the Emerson-Smith Saw Works, prior to its absorption by the Moltrup Steels Products Co., and also secretary of the Ingram-Richardson Mfg. Co., Beaver Falls.

**W. B. EVEREST**, general traffic manager, Westinghouse Electric & Mfg. Co., died at his home in Pittsburgh on Dec. 5. He was born July 3, 1868, at Newark, N. J., and has been located at the East Pittsburgh works of the Westinghouse company since 1884. He previously had been with the United States Electric Co., Newark, N. J., which was absorbed by the Westinghouse company. He had held the position of general traffic manager since 1914.

**FRED AUGUSTUS MARSH**, general purchasing agent Link-Belt Co., Chicago, died at his home in that city Dec. 11, following a stroke of apoplexy. Mr. Marsh was 51 years of age and had been connected with the Link-Belt Co. for 30 years. He had long been active in the National Association of Purchasing Agents, in which he had held important official positions.

## Fact Finding Commission's Policy

WASHINGTON, Dec. 12.—Because it has no authority to compel agreement, the Fact Finding Coal Commission will seek only by persuasion and suggestion to bring about an understanding between bituminous operators and miners. This was decided at a conference in Washington this week, called by Chairman John C. Hays Hammond, of the commission, as the result of the failure of the operators and miners to reach an agreement at their recent conference in Chicago. The spectacle of the country being faced with another coal strike next April has created genuine concern on the part of the commission and great disgust on the part of Government authorities generally, as is evidenced by their expressed sentiments. It has been pointed out by Mr. Hammond that the commission has nothing to do with arbitrating differences between operators and miners and consequently will make no attempt to settle controverted points other than by suggestion. He said that the representatives of each side have been called in an attempt to impress upon them that "the American

people expect a wage agreement to dismiss the possibility of another coal strike next April."

The commission yesterday had before it President W. K. Fields of Pittsburgh Coal Co., Pittsburgh, and President Michael Gallagher of the M. A. Hanna Coal Co., Cleveland. President John L. Lewis, United Mine Workers of America, is expected to appear during the week.

## METAL LATH STANDARDS

### Reduction of Varieties and Weights Recommended by Trade Meeting at Washington

WASHINGTON, Dec. 12.—Meeting here to-day with William A. Durgin, head of the division of simplified practice, Department of Commerce, 33 manufacturers, distributors and users of metal lath adopted resolutions calling for the reduction in varieties of flat lath from approximately 80 to 9 and the reduction in weights of rib lath from 10 to 7, with the probability that the latter will be reduced further at later conferences. It also was recommended that tolerances be not greater than 0.1 lb. per sq. yd., based on lots of not less than 1000 sq. yd. Present sheet mill practice calls for a tolerance of 2½ per cent, while that recommended at the conference runs to a maximum of 4 per cent.

The recommendations, if adopted by 80 per cent of the metal lath manufacturers, will be adopted and the standards put into effect for one year beginning July, 1923. It is estimated that 33,000,000 sq. yd. of metal lath, equivalent to about 48,000 net tons, will be consumed in 1922, a large increase over previous years, both because of the growing use of metal lath and the large building program of the present year.

The following are the sizes of metal lath that it was recommended be the only recognized standards, though their adoption is not to affect steel stocks on hand.

Standards of Flat Lath, Weights per Sq. Yd.

Painted Steel	Special Metal	Galvanized Before
2.2	2.2	2.2
2.5	2.5	2.5
3.0	3.0	3.0
3.4	3.4	3.4

¾-In. Rib Lath Standards

2.5	3.0
3.0	3.8
3.8	4.8
4.8	

The conference urged that every effort be made in the metal lath industry to direct practice to a consolidation of the 2.5, 3 and 3.8 lb. sizes to a single intermediate weight. It also was recommended that there be transmitted to an auxiliary conference of lath manufacturers the sense of the conference of today that sheet lath be standardized at 4.5 lb.

In addressing the conference Secretary Hoover said that there is a big gap between the cost of production and the price at which articles reach the consumers and that overcoming such a gap is probably the most difficult problem in trade today. He declared that the only way is to keep up consumption and eliminate waste of the process of distribution, and he pointed out that simplification is of extreme importance in this direction.

He said that he did not think that wages are coming down. It was asserted by the Secretary that prices of agricultural products are not in line with prices of manufactures and said the situation is due to maladjustment following the war. The real attack, he pointed out, is fundamental elimination of waste. Replying to claims that standardization means elimination of competition, the Secretary said that the opposite is true, because it intensifies competition.

The November wage distribution by industries at Youngstown, amounting to \$5,739,475, established a new monthly record for the year, exceeding the October disbursement by \$109,981. During the first 11 months of 1922, the industries paid approximately \$48,000,000 in wages, comparing with a total distribution last year of \$50,384,741. Employment is now well sustained, reflecting the stable industrial situation, and it is expected the 1922 payroll will exceed that of the previous year.

# Machinery Markets and News of the Works

## D., L. & W. ISSUES LIST

### Lackawanna Asks for Prices on 27 Tools — Railroad Buying Still Predominates

#### Outlook for 1923 Is Good, in the Opinion of Manufacturers and Dealers

THE Delaware, Lackawanna & Western Railroad has issued an inquiry at New York for 27 machine tools, most of them for its shops at Kingsland, N. J. The Chicago, Burlington & Quincy has made additional purchases at Chicago, and still has about \$100,000 worth of tools to buy. No action has been taken on the large inquiry of the Chicago, Milwaukee & St. Paul. Railroad business in general is fairly active, there being a fair volume of smaller orders. It is now estimated that the total purchases of the Pennsylvania Lines East for new shops at Altoona, Pa., total several hundred thousand dollars exclusive of the cranes, which were bought a few months ago at a cost of about \$225,000. Early action is expected at Cincinnati on the list of 53 machines issued by the Missouri Pacific Railroad.

At Pittsburgh two new lists have appeared, one from the Duquesne Light Co. and the other from the Western Penitentiary. It is expected that the tools inquired for some time ago by the National Tube Co. for its new plant at Gary, Ind., will be bought shortly.

In general, the machinery markets reflect the approach of the end of the year and many prospective purchasers are postponing buying until after the inventory period. It is believed in the trade that the foundation has been laid in the past few months for a very satisfactory 1923 business.

Further advances in prices are being announced by some machine-tool builders and other rises are said to be in prospect for Jan. 1.

## New York

NEW YORK, Dec. 12.

THE Delaware, Lackawanna & Western Railroad has issued inquiries for 27 machines for its shops at Kingsland, N. J., Kingston, Pa., and Buffalo. Most of the tools are for Kingsland, where the capacity of the shops will be considerably increased. Purchases of the Pennsylvania Lines East for its new shops at Altoona, Pa., are now said to total several hundred thousand dollars, not including the orders for cranes, amounting to \$225,000, which was placed a few months ago. In other respects the Eastern machine-tool market is rather dull.

The list of the Delaware, Lackawanna & Western Railroad is as follows:

- One 500-ton single-end car wheel press.
- Two 20-in. heavy-duty vertical drilling machines.
- One Whiton 6-in., 2-spindle centering machine.
- One Whiton 4-in., 2-spindle centering machine.
- One duplex control, motor-driven, horizontal-boring, drilling and milling machine; diameter of spindle 4 in.
- One planer, 48 x 48 in. x 10 ft.
- Two heavy-duty engine lathes, 30 in. x 8 ft.
- Two portable belt lathes, 18-in. swing, 4 ft. between centers.
- One Warner & Swasey No. 2 universal hexagon turret lathe.

- One 36-in. Morton draw-cut pillar shaper.
- Two motor-driven, double-spindle floor grinders, wheel 18 in., 3 in. face.
- Two double-spindle sensitive drilling machines,  $\frac{1}{8}$  to  $\frac{3}{4}$  in.
- One No. 5 Cincinnati plain milling machine.
- One double-end punch and shear, 40-in. throat.
- Two Chicago steel power bending brakes.
- Three 20-in. engine lathes, two for Buffalo and one for Kingston.
- One 32-in. shaper for Kingston.

No new crane inquiries of any size are reported, and most of the larger inquiries that have been pending for some time are still under consideration. W. C. Perry, 878 Elm Street, New Haven, Conn., is in the market for a used 20 or 25-ton, 60-ft. span, overhead traveling crane. Inquiry for locomotive cranes is heavy but few orders are so far noted. Considerable interest is exhibited by prospective purchasers in used equipment. The hand-power crane field is quiet, but an exception to this general condition is an inquiry stated to be current calling for 14 small capacity cranes, 1-motor driven. The Bureau of Supplies and Accounts opened bids to-day at the Brooklyn, N. Y., office, Thirtieth Street and Third Avenue, on the sale of three 20-ton Link-Belt locomotive cranes, two buckets and two extra booms, one Link-Belt and the other Ohio, and two locomotives all at Constable Hook, N. J.

Among recent purchases are:

Slattery Engineering & Construction Co., 10 East Forty-third Street, New York, a 10-ton crawl-tread crane, from the Brown Hoisting Machinery Co.;

O. B. S. Co., Philadelphia, a 10-ton, crawl-tread crane for use on bridge construction work in Westchester County, N. Y., from the Brown Hoisting Machinery Co.;

Oklahoma Central Power Co., Chicago, Ill., a 50-ton, overhead traveling crane from the Niles-Bement-Pond Co.;

Union Building & Construction Co., Passaic, N. J., a 7-ton locomotive crane from the Orton & Steinbrenner Co.;

American Locomotive Co., for installation at Schenectady, N. Y., two 150-ton, 75-ft. span, double trolley, overhead cranes and two 20-ton, 71-ft. span, double trolley, overhead cranes, from the Niles-Bement-Pond Co.

The General Equipment Co., 30 Church Street, New York, was high bidder on the three used Link-Belt Locomotive cranes sold by the Bureau of Supplies and Accounts on Dec. 12, which are located at Constable Hook, N. J.

The V & O Press Co., manufacturer of presses, dies and sheet metal working machinery, for many years located in Glendale, Brooklyn, N. Y., has started work on a new factory at Hudson, N. Y., to which city the business will be moved about May 1, 1923. The new building will give improved and increased facilities for the manufacture of the company's products and will also permit of broadening the scope of its operations.

The Department of Public Works, Albany, N. Y., C. L. Cadle, superintendent, will commence the erection of a new electric power plant at the Vischer Ferry dam, Saratoga County, for use in connection with the State Barge Canal, estimated to cost \$300,000.

L. Schlenker, 255 Centre Street, New York, manufacturer of dies, tools, etc., has inquiries out for a 100-lb. drop hammer.

The United States Engineer Office, Army Building, New York, will receive bids until Dec. 16 for 30 crane rail brackets and 12 roof girders, as specified in circular 2659.

The Empire State Ice Co., 76 West Monroe Street, Chicago, has purchased property at the northeast corner of Grant Avenue and 161st Street, for the erection of a three-story plant to cost \$200,000, with machinery.

The Mason Motor Truck Co., Flint, Mich., a subsidiary of the Durant Motors, Inc., 1819 Broadway, New York, will operate an eastern assembling plant in a portion of the factory of the Locomobile Co., Bridgeport, Conn., another interest of the Durant organization.

Fire, Dec. 7, destroyed a portion of the plant of the Fuller & Warren Co., Lower River Street, Troy, N. Y., manufacturer of stoves, castings, etc., with loss reported at \$60,000.

The Department of Plant and Structures, Municipal Building, New York, is having plans prepared for a four-story service and repair works for the equipment of the Department of Parks, at Columbus Avenue and Seventy-seventh Street, estimated to cost \$400,000, with machinery.



J. H. Pardee, head of the J. G. White Management Corporation, 43 Exchange Place, New York, and associates, are arranging for a reorganization of the Richmond Light & Railroad Co., Staten Island, which has been in receivership for a number of years. The new company will take over the property for \$2,000,000 and will extend and improve the plant and system for light and power service. Mr. Pardee will be president.

The American Brake Shoe & Foundry Co., 30 Church Street, New York, has negotiations in progress for the sale of its plant on Avenue L, Newark, to an industrial company in kindred line of production, whose name is temporarily withheld. It is said that the selling company will discontinue operations in the Newark district.

The Brooklyn Edison Co., 360 Pearl Street, Brooklyn, has called a special meeting of stockholders, Dec. 22, to arrange for an increase in capital from \$30,000,000 to \$50,000,000, the majority of the proceeds to be used for extensions. A fund of \$15,000,000 will be utilized for a new generating plant at Hudson Avenue and the East River, to have an ultimate capacity of 400,000 kw., and other power plant extensions. In addition, it will expend an average of \$500,000 a month during 1923 for new machinery for existing power houses and substations and extensions in transmission lines. M. S. Sloan is president.

Scott & Williams, Inc., 366 Broadway, New York, manufacturer of knitting machinery and parts, has arranged for an increase in capital from \$1,000,000 to \$2,000,000, a portion of the proceeds to be used for extensions.

The Linde Air Products Co., 30 East Forty-second Street, New York, has work under way on a new plant at North Anthony and St. Louis Streets, New Orleans.

The Richardson & Boynton Co., Dover, N. J., is disposing of a bond issue of \$1,000,000, a large portion of the proceeds to be used for extensions and improvements. D. Rait Richardson is president.

Henry Maurer & Son, Maurer, Perth Amboy, N. J., manufacturers of firebrick, refractories, etc., have acquired about 10½ acres in East Brunswick Township, to be used in connection with their local works.

The United Lead Co., Maurer, Perth Amboy, N. J., has work in progress on an addition, 300 x 300 ft., and plans to commence the installation of equipment at an early date.

Fire, Dec. 6, destroyed the lumber mill of Brady Brothers, Avenue E, Bayonne, N. J., operated under the name of the Consumers' Coal & Ice Co., with loss of about \$250,000, including power equipment, woodworking machinery, etc. It is planned to rebuild.

Officials of the Empire Cream Separator Co., Nelson Place, Bloomfield, N. J., have organized the Empire Milking Machine Co., with capital of \$500,000, to manufacture automatic milking machines and other dairy machinery. The company is headed by D. J. Welsh, H. E. McWhinney and E. A. Haeusler.

A vocational department will be installed in the four-story and basement high school to be erected at Woodbury, N. J., estimated to cost \$300,000.

Fire, Dec. 5, destroyed two shops, including forge shop, at the repair works of the Erie Railroad Co., Secaucus Road, Jersey City, N. J., with loss estimated at \$20,000.

The Public Service Production Co., Public Service Terminal, Newark, a subsidiary of the Public Service Corporation, has taken title to the new four-story reinforced-concrete building at Clinton Avenue and Twenty-first Street, Irvington. The first two floors will be equipped for a general machine and repair works for motor trucks and cars of the parent organization. The top floor will be equipped as a complete service and testing laboratory. N. A. Carle is head.

The Board of County Freeholders, Woodberry, N. J., is planning for the installation of a new electric lighting plant at the County Farm, Clarksboro.

The Thatcher Furnace Co., Garwood, N. J., with branch plant on St. Frances Street, Newark, has arranged for an increase in capital from \$750,000 to \$1,160,000, a portion of the proceeds to be used for extensions.

Fire, Nov. 28, destroyed a portion of the plant of the Fernando C. Mesa Co., Chancellor Avenue, Irvington, N. J., manufacturer of electrical porcelain products, with loss estimated at about \$75,000, including tool department and power house.

A vocational department will be installed in the new high school to be erected at Millville, N. J., estimated to cost \$250,000, for which an appropriation has been received.

The American Water Works & Electric Corporation, 50 Broad Street, New York, will issue bonds for \$1,500,000 in connection with its recent purchase of the Commonwealth Water Co., Summit, N. J., and vicinity, a portion of the proceeds to be used for extensions and improvements.

The Keystone State Construction Co., 17 West Forty-second Street, New York, and Providence, has purchased from the Worcester plant of the Whitcomb-Blaisdell Machine Tool Co., the following used tools: One 18-in. lathe, a power hack saw and a tool room grinder. The Grant Mfg. & Machine Co., Bridgeport, purchased from Pratt & Whitney a used 2½-in. Lucas boring mill. Both sales were arranged through Allen Ashley, clearing house for surplus machinery, 152 West Forty-second Street, New York.

#### Export Opportunity

Printer & Co., 711 Elphinstone Road, Bombay, India, advise THE IRON AGE that they are desirous of representing American manufacturers of metals, machinery and hardware.

### New England

BOSTON, Dec. 12.

**S**ALES of machine tools have increased, but business is far from active and is largely confined to used equipment. The most important sale of new equipment was a car wheel boring machine taken the past week by the Bangor & Aroostook Railroad. The Boston & Maine is about to close on a new 4-in. pipe machine, and the Boston & Albany on a 24-in. lathe. It is believed these sales will constitute the last business placed this year by the New England carriers. Most of them have made up their 1923 machine tool requirements, and in certain cases fair lists are represented. The question of financing machine tool purchases, however, has not been settled. Since last reports a Florence, Mass., manufacturer purchased a new 16-in. shaper; a New Hampshire interest several used upright drills and a lathe; a Connecticut manufacturer bought two milling machines and other metal-working interests have closed on odds and ends in used equipment, including a universal boring machine, which went to Ohio.

Machinery dealers have put out additional prices on miscellaneous equipment in the past week. The Laconia, N. H., authorities have issued their school machine shop requirements, which involves 15 tools, but purchase against the list will not be made until spring. Stone & Webster, Boston, are inquiring for a 75-ton, four motor, 54-ft. span crane for an Indiana plant.

The tendency of prices continues upward. A Hartford, Conn., manufacturer has made an advance of about 10 per cent on planers, and smaller percentages on other tools. Used machinery dealers report better prices on some offerings.

The Gibby Engineering Co., 96 Condor Street, East Boston, was awarded the hand stokers for the Calf Pasture Pumping Station, Dorchester, Mass. The firm's bid was \$3,148.

The State of Massachusetts, Department of Mental Diseases, W. A. Merrill, 109E State House, Boston, is asking bids until Dec. 18 on boilers, stokers, fan and engine equipment.

The Gillette Safety Razor Co., South Boston, has plans under way for an eight-story addition which will be devoted exclusively to the manufacture of razor blades. No financing will be necessary in connection with the enlargement.

The navy radio station, Miami, Fla., has been acquired by the Tropical Radio Telegraph Co., a subsidiary of the United Fruit Co., Boston. The station will be enlarged and new equipment installed.

The plant formerly occupied by the Lindquest Engineering Works, Marlboro Street, Portland, Conn., has been taken over by the Portland Machine Co. of which Charles J. Grimes, East Main Street, is general manager. It will specialize in regrinding automobile cylinders and piston work. The shop will be in charge of John Foley, Freestone Avenue.

A hydro-electric power plant of 35,000 hp. capacity is to be erected on the Pemigewasset River, near Bristol, N. H., by the Utilities Power Co. Herbert B. Rust is president, and Bertram Blaisdell, treasurer, both of Meredith, N. H.

The New York, New Haven & Hartford Railroad Co., South Station, Boston, has started work on a concrete coaling plant for locomotives at its Worcester, Mass., yards, to cost about \$45,000. It also has foundations under way for a new brick and steel engine house and repair shop on Dorchester Avenue, South Boston, to cost approximately \$75,000.

Bird & Son, Inc., 185 Devonshire Street, Boston, manu-

facturer of roofing products, is having plans prepared for an addition to its plant at East Walpole, Mass. Monks & Johnson, 99 Chauncey Street, are architects.

Sleeper & Hartley, Inc., 335 Chandler Street, Worcester, Mass., manufacturer of wire machinery, has commenced the erection of a one-story addition.

The Bangor & Aroostock Railroad Co., Bangor, Me., has plans for a new coaling station at Squa Pan, Me., to be equipped with automatic machinery.

The Keystone Mfg. Co., 53 Wareham Street, Boston, manufacturer of metal toys, plans the installation of a punch press and other equipment.

Stockholders of the American Screw Co., 21 Stevens Street, Providence, R. I., have approved an increase in capital from \$3,000,000 to \$4,500,000, a portion of the proceeds to be used for extensions and improvements.

The Transloid Products Co., Danbury, Conn., recently organized to manufacture composition products, has purchased the former factory of Warner Brothers, East Liberty Street, and will take immediate possession. Charles Hetzel is president and general manager.

The Hart & Hegeman Mfg. Co., Hartford, Conn., manufacturer of wiring equipment and other electrical apparatus, is taking title to the former plant of the Hartford Auto Parts Corporation, Russ and Lawrence Streets, and will use the structure for extensions.

Fire, Dec. 6, destroyed a portion of the power house, and cutting and polishing plant of the Columbia Granite Works, Inc., Westerly, R. I., with loss estimated at \$40,000, including equipment.

The Board of Education, Rockville, Conn., is having tentative plans drawn for an addition to the high school, to be used entirely for the vocational departments. Charles Phelps is chairman of the board.

The James Russell Boiler Works, Inc., 9 Dewar Street, Boston, has plans for an addition and will break ground at once.

A manual training department will be installed in the two-story junior high school, 221 x 225 ft., to be erected at Lynn, Mass., estimated to cost \$400,000. George A. Cornet, Donahue Building, is architect.

Latham & Crane, Inc., Willimantic, Conn., manufacturer of planing mill products, is planning to rebuild the portion of its plant destroyed by fire Nov. 24, with loss estimated at \$35,000, including equipment.

The Tileston & Hollingsworth Co., 49 Federal Street, Boston, manufacturer of paper products, will commence the erection of another addition to its plant on River Street, to cost \$30,000. Work has recently been placed under way on an addition to the machine department.

The H. & B. Machine Co., Attleboro, Mass., will commence the erection of the superstructure for a one-story addition to its Machine Shop No. 1, near the Pawtucket, R. I., line, to cost about \$100,000, including equipment. E. P. Sheldon & Son, 15 Westminster Street, Providence, R. I., are architects.

Lucas & Son, Bridgeport, Conn., are inquiring for four Garvin No. 3, duplex milling machines with 40-in. feed.

## Philadelphia

PHILADELPHIA, Dec. 11.

THE North American Foundries Corporation, Philadelphia, is being organized by local interests to take over the plant of the Thurlow Steel Works, Inc., Fourth and Booth Streets, Chester, Pa., recently acquired at a receiver's sale by Edwin H. Gackenbach of Gackenbach & Co., Inc., Widener Building, investment securities, who is interested in the new company. The plant will be remodeled for the manufacture of pistons for automobile engines, and a line of automotive castings. It is expected to commence operations in February.

Paul Brosz, 2511 West Huntingdon Street, Philadelphia, is making inquiries for a planer, band saw, bench tools and other equipment for his proposed wood-working shop.

The American Railway Express Co., Eighth and Market Streets, Philadelphia, will commence the erection of a two-story service and repair building for company trucks, 100 x 200 ft., at Thirtieth Street and Columbia Avenue.

H. M. and C. B. Siner, Church and Tacony Streets, Philadelphia, brick manufacturers, will build a one-story power house in connection with other extensions.

The James H. Billington Co., 113 Chestnut Street, Philadelphia, manufacturer of textile equipment, mill supplies, etc., has awarded contract to F. L. Hoover & Sons, 1023 Cherry Street, for an addition to its plant on North Fifth Street, to cost about \$25,000.

An appropriation of \$160,000 has been approved by the City Council, Philadelphia, for the installation of a power

system and concrete tunnels at the institution for feeble minded at Byberry. On another requisition, a 50-ton refrigerating plant will be purchased for the city hospital. F. T. Armstrong, room 316, City Hall, is purchasing agent.

The Great Atlantic & Pacific Tea Co., Broad and Somerset Streets, Philadelphia, has leased the building at Twenty-fourth and Bonsall Streets for the establishment of a service and repair works for company motor trucks.

The Edward G. Budd Mfg. Co., Twenty-fifth Street and Hunting Park Avenue, Philadelphia, manufacturer of steel automobile bodies, has taken title to a five-story concrete factory at the northeast corner of Twenty-fifth and Stokley Streets, heretofore held by the Simmons Co., for \$425,000. It will be used for extensions.

The Merchant & Evans Co., 2035 Washington Avenue, Philadelphia, manufacturer of roofing, etc., is said to be arranging a list of sheet-metal machinery and other equipment for installation in an addition.

The Electric Power Equipment Corporation, Thirteenth and Wood Streets, Philadelphia, manufacturer of high-tension electric switches and other equipment, has acquired the former Darby Building, Eighteenth Street, for a new plant. It will be remodeled and the present works will be removed to this location. L. R. Lewis is president.

The Foreign Trade Bureau of the Philadelphia Commercial Museum, Thirty-fourth Street, has received an inquiry from a company at Havre, France, desiring to get in touch with a manufacturer of belt fasteners. Full information available upon request.

The Pennsylvania Brick & Tile Co., foot of Westmoreland Street and the Delaware River, Philadelphia, will commence the erection of a new plant, for the manufacture of cement-brick, estimated to cost \$100,000 exclusive of land. In addition to manufacturing equipment, the installation will include mechanical handling and conveying machinery of different kinds, to provide for complete automatic operation. The works will have a capacity of 150 bricks per day. Louis F. Drucker is president, and Lloyd M. Chapman, engineer.

The Board of Education, Nineteenth and Chestnut Streets, Philadelphia, is planning for the erection of a three-story trade and vocational school, 150 x 170 ft., at Spring Garden and Brandywine Streets, to cost about \$750,000, including equipment.

The John A. Roebling's Sons Co., Trenton, N. J., manufacturer of wire rope, cable, etc., has authorized an increase in capital from \$15,000,000 to \$34,500,000, a portion of the proceeds to be used for extensions. Col. Washington A. Roebling is president.

A manual training department will be installed in the new school to be erected on North Montgomery Street, Trenton, N. J., for colored students, for which plans are being completed by William Slack & Son, St. Regis Building, architects.

A manual training department will be installed in the new high school to be erected at Bordentown, Pa., for which bids on a general contract are being taken. Fowler, Seaman & Co., Broad Street Bank Building, Trenton, are architects.

The Hubley Mfg. Co., Plum Street and Elizabeth Avenue, Lancaster, Pa., manufacturer of toy metal banks, etc., has awarded a contract to John Wickersham, Breneman Building, for a four-story addition, 45 x 85 ft., in the Rossmore district. J. H. Hartman is in charge.

James Farnam, 114 West Eighteenth Street, Chester, Pa., architect, is preparing plans for a one, two and four-story industrial plant, with power house, at Baltimore, totaling 165 x 325 ft., for a company whose name is temporarily withheld. Bids will be called at an early date.

The Elk Graphite Milling Co., St. Marys, Pa., a subsidiary of the Speer Carbon Co., with local plant, will soon commence the erection of a new plant in the Rettger section, for the manufacture of graphite products.

A manual training department will be installed in the new two-story and basement high school to be erected at New Holland, Pa., estimated to cost \$100,000, for which plans are being prepared by Clifford Townsley, New Holland, architect. B. G. Good is president of the Board of Education.

The Harrisburg Mfg. & Boiler Co., Nineteenth and Naudain Streets, Harrisburg, Pa., manufacturer of boilers, tanks, etc., has purchased property at Blackwood and Bolton Streets for expansion.

The Independent Oil Co., Allentown, Pa., will commence the immediate rebuilding of its distributing plant at Twelfth and Liberty Streets, partially destroyed by fire Nov. 30, with loss reported at \$60,000, including equipment.

The Lebanon Machine Screw Co., Lebanon, Pa., has taken out a State charter with capital of \$25,000 to manufacture machine screws and kindred mechanical products. Property has been acquired at East Lebanon and work on a one-story plant will commence at once. J. Warren Light, Fourth Avenue and Lehman Street, is treasurer.

The Kurtz Brothers Furniture Co., Avenue B and West



Union Street, Bethlehem, Pa., manufacturer of hotel and school equipment, etc., has awarded contract to the R. S. Rathbun Contracting Co., Bethlehem, for eight factory buildings, with main structure one-story, 60 x 270 ft., to replace its plant recently destroyed by fire with loss of \$750,000. The new plant, with machinery, will cost approximately a like amount. John and Charles Kurtz head the company.

The Coopersburg Granite Co., Coopersburg, Pa., will commence the erection of a new plant for cutting, grinding, polishing and finishing marble. A list of equipment will soon be arranged.

G. W. Corbett, 63 High Street, Pottstown, Pa., will install equipment in a local building for a foundry to specialize in the production of steel and semi-steel castings.

The Harrisburg Stanley Spring Works, Cameron and Calder Streets, Harrisburg, manufacturer of automobile springs, will install additional equipment to increase its capacity about 50 per cent, including a new furnace. C. C. Sampson is president and general manager.

The Middlesex Electric Light, Heat & Power Co., Carlisle, Pa., has been organized under State laws to install and operate a light and power plant and system in this section. Robert C. Brenneman, Carlisle, is treasurer.

The Conewago Felt & Paper Co., York Haven, Pa., now being organized under Maryland laws with capital of \$300,000, will build a local paper mill, to include departments for corrugated paper products and saturating felt. A site has been acquired on Conewago Creek, about one mile from the city, and ground will be broken early in the coming year. E. E. Brunner, president York Haven State Bank, heads the new organization. O. R. Emigh will be vice-president and general manager.

The Penn Seaboard Steel Corporation, 1417 Sansom Street, Philadelphia, is in immediate need of one 9 to 12-ton, double-acting, double-frame steam hammer, of 12 to 15-ft. clearance between legs and 150-lb. per square inch steam pressure.

The Carbondale Machine Co., Carbondale, Pa., is in the market for 200 to 306 ft. of octagon, cold-rolled steel 2% in. across flats, for screw machines.

Stone & Webster, Inc., Boston, has recently opened a branch office in Philadelphia at 307 Real Estate Trust Building, with George Chamberlain as manager. The company has several million dollars' worth of work under way in that city, including the Jefferson Hospital, a new building for the Insurance Co. of North America, a district service building for the Western Union Telegraph Co. and foundations for a power house extension for the Philadelphia Electric Co.

## Baltimore

BALTIMORE, Dec. 11.

JAMES E. SMITH, an official of the Chesapeake Paper Board Co., Claggett and Woodall Streets, Baltimore, has acquired at a public sale the plant and property of the Ironsides Board Corporation, Norwich, Conn., for \$200,000. The new owner is planning to remodel the plant and place it in operation at an early date. It will be run as a branch mill and certain machinery exempted from the sale replaced.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until Jan. 9 for five machine tools for the naval base, Bellevue, D. C., schedule 353; until Dec. 19 for 6000 ft. No. 8 single conductor cable for the Puget Sound Navy Yard, and 6000 ft. of three-conductor cable.

The Bartlett Hayward Co., Scott and McHenry Streets, Baltimore, manufacturer of machinery and parts, has taken out a permit for its one-story foundry, 202 x 262 ft., at Monroe and Nanticoke Streets, to cost about \$125,000, including equipment.

A manual training department will be installed in the new high school to be erected at Catonsville, Md., estimated to cost \$250,000, for which plans are being prepared by Smith & May, 763 Calvert Building, Baltimore, architects.

The Granite Carbonating Co., Kinston, N. C., recently organized to manufacture soda fountains, including portable fountains, is perfecting arrangements for a plant, to comprise an existing building which will be remodeled. It will include a foundry, machine shop and general metal-working department. H. F. Walker is president and general manager.

The Carolina Power Co., Raleigh, N. C., has arranged a fund of \$6,000,000 for power plant construction, including extensions and improvements in the plants and systems of its affiliated organizations, the Carolina Power & Light Co., and the Yadkin River Power Co. The work will include the construction of a hydroelectric generating station on the Cape Fear River, near Brickhaven, with an ultimate capacity of approximately 60,000 kw. The first unit is expected to be ready for service late in 1923.

The Carolina-Tennessee Power Co., Murphy, N. C., is per-

fecting plans for a hydroelectric power house on the Hiwassee River, Cherokee County, comprising two individual units with total capacity of 60,000 kw., estimated to cost \$5,000,000. W. V. N. Powellson is president, in charge.

The Bedford Pulp & Paper Co., Richmond, Va., has plans for a three-story addition to its paper mill at Big Island, Va., 60 x 140 ft., estimated to cost \$35,000, exclusive of machinery. The company recently issued bonds for \$800,000, to be used in part for expansion. Charles K. Bryant, 1808 Hanover Avenue, Richmond, is architect.

The Pennsylvania Railroad Co., Baltimore, has awarded contract to the John P. Pettyjohn Co., Lynchburg, Va., for a new engine house, with repair extension and oilhouse at Hagerstown, Md., to cost \$50,000.

The Bureau of Yards and Docks, Navy Department, Washington, D. C., will take bids until Jan. 24 for a refrigerating and ice-manufacturing plant for the naval station at Pearl Harbor, H. T., specification 4735.

The Federal Storage Battery Co., P. O. Box 111, Alexandria, Va., has leased a local building and plans the immediate installation of equipment to manufacture electric storage batteries. George W. Carroll is general manager.

Property of the McCullough Iron Works, foot of Seventh Street, Wilmington, Del., including machinery, galvanizing equipment, tools, etc., will be offered at public sale, Dec. 20.

A one-story electric power plant will be constructed by the Virginia Woolen Co., Winchester, Va., in connection with its new local mill estimated to cost \$80,000. T. B. Patton is president. Lockwood, Greene & Co., Atlanta, Ga., are architects and engineers.

The Lincoln Furniture Co., Bristol, Va., recently incorporated with a capital of \$500,000, has awarded contract for a new plant, comprising about 72,000 sq. ft. of floor area, with power house, machine shop and other departments, estimated to cost \$100,000, with machinery. C. C. Lincoln, Sr., is president.

The General Purchasing Officer, Panama Canal, Washington, will take bids until Dec. 20 for the following equipment for the canal zone: 15,000 ft. of plow-steel hoisting rope; 2000 ft. of iron or steel rope; 1600 lb. of soft steel wire; 20,000 ft. of safety fuse; one air and oil pumping outfit; 50 cast steel separators; 150 ft. of brass tubing; 200 copper controller segments; one centrifugal pump; four sets of stocks and dies; sheet iron and steel, structural steel angles and cold rolled steel, all as set forth in circular 1502.

R. P. Johnson, Wytheville, Va., machinery dealer, is making inquiries for a crude oil stationery engine with complete equipment, 25 to 40 hp., used, in good condition.

The Rowland Lumber Co., New Bern, N. C., is planning for the immediate rebuilding of its plant, known as the Roper Mills, destroyed by fire Dec. 1 with loss of about \$300,000, including power house, machinery, etc.

A manual training department will be installed in the two-story and basement high school, 50 x 220 ft., to be erected at Thomasville, N. C., estimated to cost \$200,000. Harry Simons, Banner Building, Greensboro, N. C., is architect.

C. E. Johnson, 822 West Main Street, Richmond, Va., operating a machine shop, is planning for the installation of a new lathe, shaper, drill press and other tools.

A. H. Jennings, P. O. Box 441, Greenwood, S. C., has plans for the establishment of a factory to manufacture handles, spokes and other turned-wood products.

The Salisbury Ice Co., Salisbury, Md., will commence the construction of a one-story ice-manufacturing plant, 60 x 120 ft., to have a daily capacity of 100 tons.

## Pittsburgh

PITTSBURGH, Dec. 11.

MACHINE tool business the past week has been light, but the trade seems to have lost none of its confidence in a good 1923 business, probably because there has been no material slowing up in inquiry, which includes two lists. One is from the Duquesne Light Co. and the other from the Western Penitentiary. The tools for the Gary plant of the National Tube Co., it is believed, will begin to be placed soon. Bids on about 30 tools for this project, independent of the 14 placed several weeks ago, have been asked. Sales of individual tools maintain a fairly good rate. No price changes have been announced here lately, but there are reports that a number of lines will be further advanced on or about Jan. 1.

Heavy equipment has shown a fair degree of activity the past week, in both sales and inquiries, and the recapitaliza-

tion of the Jones & Laughlin Steel Co., which contemplates an issue of \$60,000,000 of preferred stock, is believed to forecast large expenditures in modernizing its Pittsburgh works. In the past week that company bought a revolving 7-motor floor type charger for its Aliquippa works, from the Alliance Machine Co., and is expected to close shortly for a 15-ton crane. The Alliance Machine Co. also has been awarded a 5-ton electric traveling crane by the Koppers Co., for the Clairton by-product plant of the Carnegie Steel Co. The Ohio Pump & Machinery Co., Akron, is reported to have placed a 15-ton crane. The Wheeling Steel Corporation, Wheeling, W. Va., has ordered a 50-ton Morgan crane for its Portsmouth, Ohio, works. The Hanlon-Gregory Galvanizing Co., Pittsburgh, is a prospective buyer of a monorail system and a Pittsburgh district company is seeking prices on three 1-ton hoists, while an order is pending for nine small hoists. Definite inquiry is noted from a railroad equipment company for a 10-ton crane, while there is a railroad inquiry for a 15-ton electric pillar crane. Prices for estimating purposes have been asked by one interest on 21 cranes. The Carnegie Steel Co.'s dock to be built in West Braddock, Pa., for use in connection with river shipments of steel by that company, will mean an order for a gantry crane. The Blaw-Knox Co., which early in November asked for bids on a 10-ton, 75-ft. span crane, has withdrawn the inquiry. The Westinghouse Electric & Mfg. Co. has taken the order for the switch equipment for the turbine installation recently ordered for its Pittsburgh works by the Jones & Laughlin Steel Co. Mills for the Michigan Steel Corporation, Detroit, which has started work on the construction of a sheet mill, will be furnished by the Mesta Machine Co., Pittsburgh.

The National Forge & Tool Co., Irvine, Pa., is not in the market for additional shop equipment, as mentioned in last week's issue, except that it has inquired for one used Colburn drill.

Fire, Dec. 7, destroyed a portion of the plant of the Safety Sled Co., Jewett, near Kane, Pa., with loss reported at \$150,000, including machinery and stock. It is planned to rebuild.

The Studebaker Sales Co., Baum Boulevard, Pittsburgh, has awarded a contract to Conley & De Mey, 127 North Highland Avenue, for a two-story and basement service and repair works, 90 x 112 ft., at 4724 Baum Boulevard, to cost about \$65,000.

The F. J. Kress Box Co., 2930 Liberty Avenue, Pittsburgh, has awarded contract for a three-story addition, 70 x 155 ft., estimated to cost close to \$50,000.

A vocational department will be installed in the new high school to be erected at Monongahela, Pa., estimated to cost \$200,000, for which plans are now being prepared. The board of Education is in charge.

The Federal Enameling & Stamping Co., McKees Rocks, Pa., has completed plans for its three-story addition and will soon take bids. A list of equipment will be arranged. Frank Frimmer, 1133 Charles Street, is engineer.

The Airtight Weatherstripping Co., Union Arcade, Pittsburgh, manufacturer of metal weatherstrips, has acquired the business of the same character operated by George R. C. Johnston, Drexel Building, Philadelphia. The companies will be merged under the name of the purchasing organization, and the Philadelphia works continued as a branch. E. W. Lauschke is general manager.

The Freedom Oil Works, Inc., Freedom, Pa., has awarded contract to the R. B. McDanel Co., New Brighton, Pa., for a two-story addition, 50 x 75 ft., to its service and repair building, to cost about \$45,000.

Fire, Dec. 6, caused by an explosion, destroyed the forge and car shop at the coal mines of the Englert Brothers Co., Robinson Township, near Carnegie, Pa. An official estimate of loss has not been announced. It is planned to rebuild.

The Midland Smokeless Coal Co., Ronceverte, W. Va., recently organized, is planning for the installation of pumping equipment, general mine and haulage machinery, electrical apparatus, etc., at its properties. C. H. Thompson is president.

The Steele-Wallace Corporation, Richwood, W. Va., has been incorporated with a capital of \$1,750,000 to take over and merge the Fulton Mfg. Co., Richwood, and the Escanaba Mfg. Co., Escanaba, Mich., both specializing in the manufacture of woodenware products. It plans for extensions and improvements.

The United States Engineer, Huntington, W. Va., will receive bids until Dec. 16 for one electric lighting outfit for dam No. 30, Ohio River, to include a steam turbine direct-connected to a generator, with switchboard, instruments and auxiliary apparatus.

The Morgan Brothers Co., Kenova, W. Va., has acquired a site for the erection of a new hardwood mill, estimated to cost approximately \$60,000, with machinery.

The United States Engineer, Huntington, W. Va., will soon commence the construction of a new electric power plant on the Ohio River.

The Midland Smokeless Coal Co., Rupert, W. Va., is planning for the installation of electric equipment, pumping machinery and other mechanical equipment at its properties. L. E. McClung is vice-president in charge.

There is an inquiry for two 48-in., heavy type, triple geared engine lathes. Short distance between centers can be used. Address P. O. Box 249, Pittsburgh.

## Detroit

DETROIT, Dec. 11.

THE Union Carbide Co., 30 East Forty-second Street, New York, will commence the erection of an addition to its plant at Sault Ste. Marie, Mich., to cost \$500,000, including machinery.

The Simplex Paper Co., Palmyra, Mich., has commissioned the Austin Co., Cleveland, to prepare plans for an addition to its plant, including new power house, to cost \$100,000. It is expected to commence work early in the coming spring.

The Federal Drop Forge Co., Lansing, Mich., has commenced the erection of a one-story addition, 60 x 140 ft., to be used for the machine and hammer departments. It is estimated to cost \$30,000.

A vocational department will be installed in the new junior high school to be constructed at Port Huron, Mich., estimated to cost \$300,000, for which bids on a general contract are being received until Dec. 18. Van Leyen, Schilling, Keough & Reynold, 3440 Cass Avenue, Detroit, are architects.

Fire, Dec. 3, destroyed a portion of the plant of the Monroe Paper Co., Monroe, Mich., with loss estimated at \$50,000. It is planned to rebuild.

The Detroit Steel Products Co., East Grand Boulevard and Griffin Street, Detroit, has acquired the former plant of the Patterson Mfg. Co., Holly, Mich., which has been idle for a number of years. The new owner will remodel the works for a branch plant.

The Michigan Gas & Electric Co., Three Rivers, Mich., has preliminary plans under way for a new hydroelectric power plant on the St. Joseph River, near Mottville, Mich., to cost approximately \$450,000.

The Handley Motors, Inc., Kalamazoo, Mich., has been organized to take over and operate the Handley-Knight Motors Co., with local plant for the manufacture of automobiles. The new company is capitalized with 600,000 shares of stock, no par value, and plans for extensions for the production of a six-cylinder motor instead of a four-cylinder engine as heretofore. It will also manufacture chassis. James I. Handley is president.

The Stout Metal Airplane Co., Detroit, has been incorporated with a capitalization of \$300,000 to manufacture airplanes perfected by William B. Stout, president of the company. Glenn H. Hoppin and Stanley E. Knauss are associated with Mr. Stout in the new enterprise.

The Morrison Metal Stamping Co., Jackson, Mich., has been incorporated with a capital of \$250,000. Clarence B. Hayes, 709 West Main Street, Jackson, is president of the new company and his associates are William D. Brundage and C. Stanley Porter of the same city.

The Guy Disk Valve Motor Corporation, Ypsilanti, Mich., has acquired the former Alco Engine Co.'s plant in Hillsdale, Mich., and will transfer its business to that place in the near future. The company manufactures a new type of automobile engine which several manufacturers have contracted for on a royalty basis.

The Athol Mfg. Co., Marysville, Mich., is planning to enlarge its plant and install additional machinery to manufacture a new line of products in addition to its established line of rubberized goods.

The Federal Drop Forge Co., Lansing, Mich., is increasing its capacity by an addition, 60 x 140 ft., in which new machinery will be installed. The company is at present producing automotive, gas engine and lawn mower forgings.

Representatives of the Ford Motor Co. are acquiring property at Ypsilanti, Mich., on which a factory will be erected. This is in connection with the waterworks site approved for sale to the Ford Co.

The Steel Products Co., Detroit, has acquired the plant of the defunct Patterson Mfg. Co., Holly, Mich., which has been vacant for several years. It is expected that between 75 and 100 men will be employed within a few months.

The Chatfield Bronze & Iron Works, Gladstone, Mich., has begun operations and took off the first heat several weeks ago. It will produce bronze and gray iron castings and will add a machine shop to its plant in the near future.

The Reliable Mfg. Co., Pontiac, Mich., has been organized



to manufacture the Mott threading machine, a new device for threading metal pipes. Wendell J. Mott, the inventor, is vice-president and general manager of the new company and associated with him are W. Hayes McKinney, Detroit, as president, and William C. Bryant, secretary and treasurer.

The Blakely Mfg. Co., Wabash and Stanley Avenues, Detroit, is in the market for salvage sheet steel in 22, 20 and 16-gage, flat only.

## Cleveland

CLEVELAND, Dec. 11.

EVIDENCE of the usual December slump in the machinery market is noted, but dealers are still getting a fair volume of single tool orders. There is some activity in the Detroit automobile field, and a Cleveland machinery house has closed an order for approximately \$40,000 worth of machinery. Other orders from Detroit include two 2-spindle drills for the Kelsey Wheel Co., and two surface grinders for the Ford Motor Co. The National Screw & Tack Co., Cleveland, is making inquiry for considerable equipment for its extensions. These purchases will probably include a number of bolt-heading machines. The company will add to its products the manufacture of hardened and ground special bolts used in the automotive field, and equipment will be bought for the manufacture of this new line.

Local dealers are receiving a moderate volume of inquiries, but it is probable that the placing of many orders will be deferred until after the first of the year. The Columbia Chemical Co., Barberton, Ohio, has an inquiry for a 1-ton electric traveling crane.

The plant of the Forest City Machine & Forge Co., 5101 Lakeside Avenue, Cleveland, has been sold by authority of the Federal Court to V. B. Torbensen, president of the recently organized Vig-Tor Axle Co., for \$225,000. The plant was completed during the war for shell work and includes two three-story buildings, one 40 x 70 ft., one 17 x 85 ft., and a main machine shop, 100 x 296 ft. The purchase also includes equipment which consists of about 200 machine tools, a portion of which are adapted for the manufacture of axles. The Vig-Tor Axle Co. will occupy the plant about Jan. 15 and expects to buy additional equipment. Offices at present are in the Bulkley Building. A. L. Kroesen, formerly of Timken Detroit Axle Co., will be vice-president and general manager; W. N. Jackson, treasurer, and Carl H. Harrison, secretary.

The Marquette Metal Products Co., Cleveland, has leased from the International Steel Tie Co., 10,000 sq. ft. of floor space at 19,906 Waterloo Road, for factory purposes.

The plant of the Collinwood Foundry & Mfg. Co., 17,004 Waterloo Road, Cleveland, has been purchased at receiver's sale by Max Greenhut, president-treasurer, L. N. & N. Foundry Co. The plant will probably be operated under its old name and the business of the L. N. & N. Foundry Co. moved to this location. The foundry covers 120 x 150 ft. and it is equipped for one cupola.

The Maumee Metal Parts Co., Toledo, has purchased a building of Huebner-Toledo Brewing Co., at Hamilton Street and the New York Central Railroad, and is remodeling it for factory purposes. The company manufactures aluminum castings.

The Lima Sheet Metal Co., Lima, Ohio, will shortly make extensions at an estimated cost of \$7,000.

The Fairfield Engineering Co., which has moved its plant from Lancaster to Marion, Ohio, has placed contract for a one-story brick and steel factory, 90 x 140 ft. It manufactures conveying and unloading machinery.

The Toledo Pipe Threading Machine Co., Toledo, Ohio, is planning extensions. It has increased its capital stock from \$50,000 to \$1,000,000 by a stock dividend and will expend the cash surplus for additions and improvements.

## Buffalo

BUFFALO, Dec. 11.

FOLLOWING a reorganization of the Dunlop Tire & Rubber Corporation of America, Buffalo, a bond issue of \$5,000,000 has been arranged, a portion of the proceeds to be used for extensions, particularly in other factories in different parts of the country. Operations will be resumed at the local works at once. Sir Eric Geddes, an official of the

parent organization, the Dunlop Rubber Co., Ltd., has been elected chairman of the board of the subsidiary concern.

The Jamestown Store Front Co., 29 North Main Street, Jamestown, N. Y., manufacturer of metal store fronts, is planning for the installation of new equipment at its plant.

The Lautz Co., 861 Main Street, Buffalo, will install grinding, cutting, polishing and conveying equipment at its marble plant, 110 x 480 ft., on East Ferry Street, now in course of erection. A two-story office adjoining, 40 x 88 ft., will also be built.

L. L. Brown and A. J. Gust, Angola, N. Y., have plans for a new one-story ice-manufacturing and refrigerating plant, 65 x 70 ft. H. W. Schantz, 78 Main Street, Buffalo, is architect.

Kittinger Brothers, 1893 Elmwood Avenue, Buffalo, have awarded a contract to Harding & Crea, White Building, for a three-story addition, 90 x 115 ft., to their furniture manufacturing plant, estimated to cost \$50,000.

The Prene Mfg. Co., Buffalo, has acquired three buildings at the plant of the Wickwire-Spencer Steel Corporation, River Road, for the establishment of a new plant to manufacture skid chains. Possession will be taken at once and equipment provided to give employment to about 200.

The Republic Light, Power & Heat Co., Dunkirk, N. Y., has been ordered by the Public Service Commission to make extensions in its plant and system, including natural gas facilities and distribution, to cost about \$2,000,000.

The American Locomotive Co., 30 Church Street, New York, is planning for an addition to its Brooks Works, Dunkirk, N. Y., to cost \$50,000.

The American Laundry Machinery Co., Kossuth Street Subway, Rochester, N. Y., has called a special meeting of stockholders to arrange for an increase in capital from \$8,000,000 to \$14,000,000, a portion of the proceeds to be used for extensions and improvements.

The Charles E. McGill Machine Co., Commercial Avenue, Binghamton, N. Y., manufacturer of textile machinery and parts, recently organized, has tentative plans for a new factory. Charles E. McGill, formerly president McGill & Holford Mfg. Co., in the same line of production, heads the new organization.

Fire, Dec. 2, destroyed a portion of the power house at the plant of the Union Explosives Co., Le Roy, N. Y. It is planned to rebuild at once.

The New Ice & Coal Co., 925 Clinton Street, Jamestown, N. Y., is arranging for the construction of a new ice-manufacturing and refrigerating plant to cost \$25,000, exclusive of machinery.

The Board of Erie County Commissioners, City Hall, Buffalo, has plans for a one-story power house and refrigerating plant, 75 x 100 ft., at Alden, estimated to cost \$50,000. W. A. Kidd, 524 Franklin Street, is architect.

The Vacuum Oil Co., Rochester, N. Y., affiliated with the Standard Oil Co., New York, has arranged for an increase in capital from \$15,000,000 to \$70,000,000, a portion of the proceeds to be used for extensions.

The Rochester Packing & Cold Storage Co., 78 Front Street, Rochester, N. Y., has completed plans for an addition and improvements to its ice and refrigerating works, estimated to cost \$175,000 with machinery.

Adolph P. Goehler, Buffalo, has made application to construct and operate a machine shop, 40 x 50 ft., at 288 Genesee Street, for general machinery and parts production.

The National Brake Co., Ellicott Square, Buffalo, is planning for the erection of a branch factory at Bridgeburg, Ont., to cost \$35,000.

The Empire State Ice Co., Chicago, will build an ice-manufacturing plant at Atlantic Avenue and the New York Central Railroad crossing, Rochester, N. Y. About \$250,000 will be expended for machinery.

## Cincinnati

CINCINNATI, Dec. 11.

BIDS on the Missouri Pacific list of 53 machines, published last week, were taken at St. Louis Dec. 8, and indications point to early action by the road. A local manufacturer has received confirmation of a railroad order for 30 machines, the informal order for which was placed a few days ago. Scattered orders for single machines made a fair total, but on the whole the market is quieter than for several weeks. Manufacturers are of the opinion that some sizable lists will appear within the next three weeks from railroads and industrial companies which have not yet expended their 1922

appropriations. A note of optimism is evident in the machine tool trade, and next year is expected to see a return of better business.

The control of the Icy-Hot Bottle Co., Cincinnati, manufacturer of vacuum bottles, has been acquired by a group of Cincinnati business men, headed by Gustave Mattman, president Willard Machine Tool Co. No changes will be made in the company's plans for the present other than that Mr. Mattman will assume personal supervision of the company's affairs.

The P. Goldsmith & Sons Co., Cincinnati, manufacturer of sporting goods, has acquired property adjacent to its plant on Findley and John Streets, and will shortly commence the erection of an addition containing 55,000 sq. ft. of floor space.

The Mengel Body Co., Louisville, Ky., which will build automobile and truck bodies, has awarded contract for a plant containing approximately 200,000 sq. ft. of floor space. It will shortly issue a list of equipment and work will be rushed so that manufacturing operations may be commenced early in the spring. Arthur D. Allen is president of the company.

The Tennessee Copper & Chemical Corporation, Hamilton, N. Y., producer of fertilizers, has commenced the erection of a plant at Glendale, near Cincinnati, to cost approximately \$50,000.

The M. J. Kehoe Co., London, Ohio, has been incorporated with a capitalization of \$25,000 to manufacture power washing machines. It plans the establishment of a factory in London.

The Ohio State University, Columbus, Ohio, which is completing the erection of a power house, is negotiating with the War Department for the purchase of the Government power plant at Langley Field. It has not yet been declared surplus property and for that reason has not been put up for sale.

## Chicago

CHICAGO, Dec. 11.

**T**HE Chicago, Burlington & Quincy has made additional purchases against its list, but still has about \$100,000 worth of special heavy railroad tools to buy which will probably be placed during the current week. The Chicago, Milwaukee & St. Paul has taken no action against its inquiry. Both inquiries and orders from miscellaneous consumers are few, and it is now believed that the market will remain quiet until the opening of the new year. Auction sales of bankrupt stocks, while not so numerous as some months ago, still constitute a factor which cannot be overlooked by the trade. On Dec. 15, the plant and equipment of the Spacke Machine & Tool Co., Indianapolis, inventoried at \$1,750,000, will be disposed of. The Stewart-Warner Speedometer Corporation, Chicago, has bought a small installation of polishing lathes.

The General American Tank Car Corporation, Chicago, is inquiring for a 10-ton three-motor overhead traveling crane.

The Evens Fibre Box Co., 4734-60 South Spauling Avenue, Chicago, has let contract for a one and two-story factory, 101 x 483 ft., and 21 x 127 ft., to cost \$150,000.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, has let contract for a one-story power station, 38 x 50 ft., 2141 South Troy Street, to cost \$16,000.

E. Valkman, 3966 Avondale Avenue, Chicago, has let contract for a one-story tin shop, 22 x 50 ft. and 26 x 30 ft., at 4520 Irving Park Boulevard, to cost \$7,000.

The Diamond Crystal Salt Co., St. Clair, Mich., has commenced the construction of a machine shop, 50 x 178 ft.

The plant of the Meyer Furnace Co., Peoria, Ill., was recently destroyed by fire with an estimated loss of \$100,000.

The Ryan Car Co., 13501 Baltimore Avenue, Chicago, is considering plans for an addition to its plant. A. J. T. Bennett, First National Bank Building, is architect.

The Phelps Electric Co., Chicago, manufacturer of electric flashing devices and other equipment, has arranged for the removal of its plant from 163 North Curtis Street to 227 West Randolph Street, for increased facilities. The new location will provide approximately 5000 sq. ft. of floor space.

The American Radiator Co., 820 South Michigan Avenue, Chicago, is calling for bids on a general contract for the construction of its proposed new plant on Minnehaha Street, St. Paul, Minn., to comprise a number of one and two-story buildings, estimated to cost in excess of \$1,000,000, with

machinery. A. H. Stem, 601 Endicott Building, St. Paul, is architect.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, is arranging for the sale of a new stock issue of \$12,000,000, a large portion of the proceeds to be used for new power-plant construction, and extensions and improvements in present generating stations and lines.

The Oliver Iron Mining Co., Hibbing, Minn., has plans in progress for extensions and improvements in its plant to cost about \$140,000, including the installation of additional equipment. The work will comprise a new crushing and screening plant at the Hull Rust mine, to cost about \$98,000; remodeling and improving of machine shop, and the installation of additional equipment; extensions and improvements in the crushing and screening plant at the Morris mine; erection of new one-story machine shop, for parts production and repairs.

The Board of Directors, St. Olaf's College, Northfield, Minn., will commence the erection of a new one-story power plant at the institution, to cost \$300,000.

A manual training department will be installed in the proposed new two-story and basement high school, to be erected at De Witt, Iowa, estimated to cost \$125,000, for which John C. Wood & Co., architects, 410 Howes Building, Clinton, Iowa, will prepare plans.

The Red Wing Sewer Pipe Co., Red Wing, Minn., manufacturer of vitrified sewer pipe, has commissioned A. F. Gauger, 302 Central Bank Building, St. Paul, Minn., architect, to prepare plans for a three-story plant, 75 x 275 ft., estimated to cost \$90,000, including machinery. It will replace a works recently destroyed by fire.

The Hamler Boiler & Tank Co., 6025 West Sixty-sixth Street, Chicago, is inquiring for one 16-ft. plate-bending roll, used, in good condition.

## Milwaukee

MILWAUKEE, Dec. 11.

**D**ESPITE the fact that the holiday spirit is becoming more pronounced, a moderate volume of business is passing in the machine tool trade. Inquiry is being sustained at a much higher point than usual during the first half of December. It is, however, predicated more on needs which will be placed early in the new year than on immediate requirements. Automotive industries form the chief figure, especially in the milling machine demand.

Employment bureaus report that while the general call for help has fallen off, this is due mainly to the cessation of outdoor activities, and there is a shortage of skilled men for metal-working, tannery and shoe factories.

The Huron Portland Co., 1525 Ford Building, Detroit, has awarded initial contracts, for excavation and piling, for its new dock, warehouse and distributing building in Milwaukee, on the Burnham Canal, to cost about \$225,000. Construction contracts probably will not be let before Jan. 1. The project involves considerable hoisting and conveying machinery, electric motors, etc. J. W. Boardman, vice-president, Detroit, is in charge.

The Random Lake Ice Co., Locust Street, Milwaukee, has engaged the George B. Bright Co., consulting engineer, Detroit, to design an artificial ice plant and storage and distributing warehouse, 100 x 125 ft. Inquiry is being made for equipment, including a large ice machine, with electric motor drive. John T. Hoff is president and general manager.

The American Garage Equipment Co., Milwaukee, authorized capital \$250,000, and the American Auto Hoist Co., Milwaukee, authorized capital \$50,000, have been granted corporate charters in Wisconsin to engage in manufacturing. The identity of the principals is withheld for the present by Louis Wiener, of Wolfe & Kolinski, attorneys, 425 East Water Street, Milwaukee, who appears as incorporator. A statement concerning the plans will be forthcoming shortly, according to Mr. Wiener.

The Hansen Canning Machine, Corporation, Port Washington, Wis., has placed the general contract with the National Construction Co., 490 Virginia Street, Milwaukee, for erecting a steel, brick and concrete manufacturing plant, 112 x 120 ft., at Cedarburg, Wis. The investment in building and machinery will be about \$100,000.

The S. E. Tate Printing Co., 133 Second Street, Milwaukee, has engaged Rosman & Wierdsma, architects, 424 Jefferson Street, local, to prepare plans for its new printing and publishing plant, 50 x 175 ft., seven stories and basement. Contract for the substructure has been let to the Robert L. Reisinger Co., 495 Oakland Avenue. Other con-



tracts will not be placed before March 1. E. L. Arnold is president and general manager of the Tate company.

The Belle City Malleable Iron Co., Racine, Wis., which is enlarging its capacity approximately 100 per cent, has increased its capitalization from \$500,000 to \$1,300,000. The increase of \$800,000 represents the cost of improvements. A two-story annealing building, 75 x 357 ft., is being completed and will be ready about Jan. 15. A new \$25,000 office building will be ready Dec. 15. Contracts will be let about Feb. 1 for the remaining structures, including a large foundry and auxiliaries. The entire plant will be replaced by modern buildings and equipment without interruption of operations. The concern specializes in automotive and agricultural castings.

The Milwaukee Gas Specialty Co., 2017 Clybourn Street, Milwaukee, let the general contract to Henry Danischefsky, 1484 Humboldt Avenue, local, for an addition, 45 x 120 ft., two stories. Inquiry is being made for equipment for manufacturing portable gas stoves, cigar lighters and other gas appliances and specialties. Otto F. Pfeil is president and general manager. The architects are Leiser & Holst, 105 Wells Street.

The Vollrath Co., Sheboygan, Wis., manufacturer of enameled utensils and stampings, is building an addition to its annealing building at an estimated cost of \$45,000.

The Board of Education, Viroqua, Wis., has selected a site and will engage an architect immediately to draw plans for the proposed new high school and vocational training institute, for which a bond issue of \$150,000 has been sold. Work will begin about March 1.

James W. Andrewson, who has resigned as assistant manager American Brass Co., Kenosha, Wis., is organizing a new \$100,000 corporation to establish a new brass industry in Kenosha, which will specialize in seamless tubing and rods, it is said. John Henry, mechanical superintendent, and George Rahr, general foreman, with three other factory executives, also resigned from the American company service and will be associated with Mr. Andrewson in the new enterprise. Further details will be given out later.

The All-American Metallic Casket Co., Nichols, Wis., a new \$50,000 corporation, has work under way on a factory, 50 x 160 ft., two stories, containing a metal fabricating room, mill room, plating room, finishing department, etc. Equipment is now being purchased. The plant will employ about 60 at the start.

The Globe Ball Co., Milwaukee, manufacturer of steel balls, ball bearings, etc., is planning to enlarge its works at Forty-seventh Avenue and Rogers Street, West Allis. The capital stock has been increased from \$75,000 to \$150,000 and the corporate title changed to the Globe Bearings Co. Philip Grossman is secretary-treasurer and general manager.

The Perfection Table Slide Mfg. Co., Watertown, Wis., a new \$125,000 corporation, has plans for a new plant costing about \$75,000, work on which will begin April 1. In the meantime inquiry is being made for equipment for production of extension tables and other hardwood furniture specialties. William C. Schultz is president and general manager; E. W. Pfeifer, vice-president; E. H. Cook, secretary-treasurer.

The Kimberly-Clark Co., Neenah, Wis., manufacturer of pulp and paper, has let the contract to C. R. Meyer & Sons Co., Oshkosh, Wis., for a \$75,000 mill addition.

The Nichols Mfg. Co. is being organized at Nichols, Wis., by J. A. Baurichter to manufacture automotive devices, anti-glare shields and other specialties. For the present it will operate in leased quarters.

## Indiana

INDIANAPOLIS, Dec. 11.

**T**HE American Steel & Wire Co., Kokomo, Ind., is planning for extensions in its local works, including the installation of additional equipment, estimated to cost \$400,000. The work will include an addition to the power house, with new boilers, stokers and auxiliary apparatus.

The Board of Education, Ohio and Meridian Streets, Indianapolis, has plans under way for a one-story repair shop, 175 x 220 ft., and warehouse on Martindale Avenue, estimated to cost \$75,000, including equipment. William Earl Russ, Meridian Life Building, is architect.

The Langhaar Ball Bearing Co., Aurora, Ind., has commenced the erection of a new plant on site recently acquired. Adjoining property has also been secured and will be improved with a one-story extension. The present works will be removed to the new location and additional equipment installed.

The Indianapolis Light & Heat Co., Indianapolis, has made application to issue common stock for \$1,962,000, a portion of the proceeds to be used for extensions and improvements.

The Fort Wayne Box Co., Fort Wayne, Ind., has tentative plans for a new factory on Superior Street to cost \$100,000, including machinery.

New interests have acquired the plant and equipment of the Arvac Mfg. Co., Anderson, Ind., and plan to reorganize for the manufacture of a cotton dusting machine and similar equipment. The works will be remodeled and operations commenced at an early date. About \$400,000 was given for the Arvac assets.

The Madden-Copple Co., Indianapolis, operating a general machine and repair works for motor trucks and automobiles at 209 West North Street, has leased a one-story building, 120 x 122 ft., to be erected at St. Clair Street and Capitol Avenue, for a new works. It is planned to remove the present shop to the new location and install additional equipment. Charles E. Campbell is president.

## The Gulf States

BIRMINGHAM, Dec. 11.

**T**HE Corsicana Ice Co., South Fourteenth Street, Corsicana, Tex., will install additional equipment at its electric power plant to double the present capacity.

Stockholders of the Magnolia Petroleum Co., Dallas, Tex., operating oil refineries, have approved of an increase in capital from \$120,000,000 to \$180,000,000, a portion of the proceeds to be used for extensions and improvements.

The City Council, Corpus Christi, Tex., has authorized the city engineer to prepare estimates of cost and data relative to the construction of a municipal electric light and power plant.

A manual training department will be installed in the three-story junior high school, 160 x 225 ft., to be erected at Jacksonville, Fla., for which bids on a general contract have been called. Freeley & Benjamin, Blisbee Building, are architects.

The Vernon Ice & Electric Co., Vernon, Tex., has been organized as a subsidiary of the Texas Central Power Co., to take over and operate the local light and power plant. Plans are under way for extensions and the installation of additional equipment.

C. L. Wagenknecht, Fort Pierce, Fla., and associates, have organized a company to build and operate a local machine works, primarily for marine service. Foundations for the initial building are under way and a list of equipment will be prepared at once, to include lathes, drills, bench tools, etc.

The Common Council, Lafayette, La., is disposing of a bond issue of \$144,000, the proceeds to be used for the installation of a municipal light and power plant and extensions in the waterworks.

The Prest-O-Lite Co., Indianapolis, a subsidiary of the Union Carbide Co., 30 East Forty-second Street, New York, manufacturer of acetylene apparatus, is perfecting plans for the erection of a new plant on site at Upperline Street and the Seventeenth Street Canal, New Orleans, acquired some time ago. It is estimated to cost \$200,000, with equipment.

The Yuba Oil Co., Nacogdoches, Tex., has acquired the local oil refinery and property of the Carolina Oil Co. for about \$100,000. The new owner will take immediate possession and plans for enlargements and the installation of new equipment. C. C. Chappell is in charge.

The Young Lumber Co., Auburn, Ala., is planning to rebuild the portion of its mill recently destroyed by fire with loss estimated at \$30,000, including machinery.

The United States Engineer, Florence, Ala., will receive bids until Dec. 30 for one 15-in. dredging pump and appurtenances for the United States dredge Pettus, as per specifications on file.

The Atlantic Ice & Coal Corporation, Atlanta, Ga., is planning for a new ice-manufacturing and cold storage plant at Montgomery, Ala., with initial capacity of 150 tons of ice per day and storage facilities totaling 100,000 cu. ft. It is estimated to cost \$300,000, including machinery.

A vocational department will be installed in the new junior high school to be erected at Brownwood, Tex., estimated to cost \$120,000.

The San Antonio Portland Cement Co., San Antonio, Tex., has awarded a contract to the Elder Construction Co., San Antonio, for a one-story addition to its mills at Cementville, estimated to cost \$50,000 with equipment.

A one-story power house addition will be built by the Texas Cotton Mills Co., McKinney, Tex., in connection with its new textile mill to cost \$600,000, with machinery. The machine shop will also be extended and other mechanical equipment installed.

The Common Council, Perryton, Tex., is arranging for a bond issue of \$35,000, the proceeds to be used for the installation of a municipal electric power plant and system.

The Sterling Gas & Products Co., Bastrop, La., has preliminary plans for a new gasoline refinery and carbon producing plant at Morehouse Parish, near Bastrop, estimated to cost \$200,000, including machinery. It also maintains offices at Tulsa, Okla.

B. M. Fluker, Richland, Tex., operating the local electric power plant, will commence the installation of additional equipment for increase in capacity. About \$20,000 will be expended.

The Common Council, Canton, Tex., is arranging for a bond issue of \$40,000, the proceeds to be used for a municipal electric lighting plant and extensions in the waterworks.

The Southern Paper Co., Moss Point, Miss., is disposing of a bond issue of \$1,200,000, a portion of the proceeds to be used for the erection of a new pulp and paper mill.

The Electrified Water & Machinery Co., Dallas, Tex., has leased a building, 63 x 120 ft., to be constructed on South Ervay Street, for a new plant to manufacture mechanical equipment.

The Texas Gas & Electric Co., Orange, Tex., will install a new 225-hp. engine, electrical equipment and auxiliary machinery at its local power plant. Line extensions will also be made.

### Buying for National Railways of Mexico

The Western Purchasing Co., El Paso, Tex., has been appointed foreign purchasing agent for the National Railways of Mexico. This appointment applies to the purchasing of all materials not bought in Mexico City. In the past foreign purchases for the National Railways of Mexico were handled by the New York and Houston, Tex., offices, which now have been ordered closed, and the records of both offices are being sent to El Paso to become a part of the files of the Western Purchasing Co. It is estimated that the purchases to be handled at El Paso will average more than \$200,000 United States currency per month.

Will Solomon, who is president of the Western Purchasing Co., announces that purchases, where possible, will be made directly from manufacturers through their El Paso representatives and that all bills will be discounted by the company. The arrangement became effective Dec. 1.

### The Central South

ST. LOUIS, Dec. 11.

**T**HE Springfield Ice & Refrigerating Co., Springfield, Mo., will take bids at once for an ice-manufacturing plant to cost \$60,000. Ophuls & Hill, 112 West Forty-second Street, New York, are engineers. A. F. Johnson is head.

The International Aircraft Co., Kansas City, Mo., care of Clifton B. Sloan, 321 East Eleventh Street, architect, has plans under way for a one-story plant, 103 x 200 ft., at Davenport Road and Seventy-first Street, for the manufacture of airplanes and parts, estimated to cost \$80,000. Robert B. Hawley is president.

The Post Glover Electric Co., Ludlow, Ky., is planning to rebuild the portion of its electric power plant recently destroyed by fire with loss of \$35,000, including equipment. Frank V. Van Winkle is president.

The White Mining Co., 1518 Kentucky Avenue, Joplin, Mo., is planning for the installation of additional equipment at its plant, including air compressors, gas engine and appurtenances, transmission apparatus, etc.

The Radio Shop, Inc., Sunnyvale, Cal., manufacturer of radio equipment, has arranged for the establishment of a branch plant at St. Louis and will be affiliated with the Echo Radio Corporation, 315 International Life Building, St. Louis, recently organized. A. B. Dorman will be manager in charge at this point.

The stockholders of the Standard Oil Co. of Kansas, Wichita, have approved of an increase in capital from \$2,000,000 to \$8,000,000, a portion of the proceeds to be used for extensions and improvements in refineries and other properties.

The Grimm Metal Sign Corporation, 700 South Eighteenth Street, St. Louis, recently organized, has leased a building and will install equipment for the manufacture of metal signs, etc. H. A. Grimm is president, and H. Tandberg, general manager.

The Coupe De Luxe Body Co., St. Louis, has leased 15,000 sq. ft. at Thirteenth and Rutger Streets, in the vicinity of its present automobile body manufacturing plant, and will use it for expansion.

The Cumberland Pipe Line Co., Winchester, Ky., operating oil refineries and pipe lines, has called a special meeting of stockholders Dec. 27 to approve an increase in capital from \$1,500,000 to \$3,000,000, a portion of the proceeds to be used for extensions and improvements.

The Sand Springs Power, Light & Water Co., Sand Springs, Okla., is perfecting plans for extensions in its electric power plant to double, approximately, the present capacity of 15,000 kw. New transmission and distributing lines will also be built.

The Grace Sign & Mfg. Co., 425 South Main Street, St. Louis, is planning for the operation of a new plant at Second and President Streets. A building on the site will be equipped at once.

A manual training department will be installed in the proposed high school to be erected at Nevada, Mo., estimated to cost \$110,000. C. A. Smith, 602 Finance Building, Kansas City, Mo., is architect.

The Clinton Coal Co., Jeff, Ky., will soon be in the market for mine cars and other equipment for installation at its properties. E. H. Griffith is general manager.

Electrically operated pumping machinery and other power apparatus will be installed at the municipal waterworks, Kirksville, Mo., in connection with general improvements and extensions in the plant to cost \$325,000. Black & Veatch, Mutual Building, Kansas City, Mo., are engineers.

The Purchasing Agent, Post Office Department, Washington, will take bids until Dec. 22 for the installation of a conveyor system at the United States Post Office, Oklahoma City, Okla.

A manual training department will be installed in the three-story high school to be erected at Sedalia, Mo., for which a bond issue of \$500,000 is being arranged.

C. R. Williamson, Trezevant, Tenn., is planning for the establishment of a plant to manufacture special farm implements. Initial operations will be devoted primarily to assembling; later, a plant for castings and parts will be installed. A company will be organized to operate the works.

George Roderick, 1112 East Douglas Street, Wichita, Kan., is making inquiries for a jig saw, boring machine, combination wood-working machine and other equipment.

The Pat Mfg. Co., Randall Building, 210 West First Street, Oklahoma City, Okla., recently organized, has arranged for the establishment of a plant to manufacture dust pans and kindred metalware. Sidney C. Bray is general manager.

The Modern Auto Parts Co., 1803 Park Avenue, St. Louis, is planning for the installation of additional equipment.

A power house will be constructed at the new plant of the Brown Shoe Co., Washington Avenue and Sixteenth Street St. Louis, at Union City, Tenn., estimated to cost \$250,000. Albert B. Groves, St. Louis, is architect.

A vocational department will be installed in the proposed new high school to be erected at Kirksville, Mo., for which bonds for \$190,000 are being arranged. Irvin Dunbar, care of the Board of Education, is architect.

### The Pacific Coast

SAN FRANCISCO, Dec. 5.

**T**HE Comet Oil Co., Los Angeles, recently organized with a capital of \$600,000, has acquired property on East Twenty-sixth Street as a site for a new refinery, with capacity of about 2500 bbl. per day, estimated to cost \$500,000. It is headed by Adolph Ramish and J. J. Gans.

The Westinghouse Electric & Mfg. Co., First National Bank Building, San Francisco, is completing plans for the initial units of its new plant at Emeryville, Cal., to cost \$900,000, including equipment. The company engineering department, Union Building, Pittsburgh, Pa., is in charge.

The National Paper Products Co., Stockton, Cal., has awarded a contract to the Davis-Heller-Pearce Co., Delta Building, for an addition, to cost \$125,000, with machinery.

The Concrete Pipe Co., Kelso, Wash., has preliminary plans under way for a plant near Freeport, Wash., to cost in excess of \$75,000, with equipment.

The Pacific Power & Light Co., Portland, Ore., has plans in progress for a hydroelectric power plant on the Deschutes River, estimated to cost more than \$3,000,000, with machinery and transmission lines.

The Puget Sound Lumber & Box Co., 1201 East Northlake Avenue, Seattle, Wash., will commence the construction of a new one-story plant, 78 x 225 ft., with wing extension 79 x 130 ft., estimated to cost \$35,000.

The Visalia Implement Works, Inc., Visalia, Cal., will commence the construction of a new one-story plant to cost \$10,000, with equipment. The company is headed by J. S. Johnson.

The Sacramento Pipe Works, R Street near Seventh Street, Sacramento, Cal., has plans under way for a number



of buildings, with main works 150 x 230 ft., one-story. It is estimated to cost more than \$80,000, with machinery.

Stockholders of the Standard Oil Co. of California, 200 Bush Street, San Francisco, have approved of an increase in capital from \$115,000,000 to \$250,000,000, a portion of the proceeds to be used for extensions and improvements in refineries.

The Blue Tank Pipe Line & Refinery Co., Long Beach, Cal., has acquired 15 acres at Wilmington, Los Angeles, as a site for a new refinery to cost close to \$900,000, including machinery.

## Canada

TORONTO, Dec. 11

ALTHOUGH the holiday season is near, dealers continue to report an active demand for machinery and tools. Building trades are busy on the construction of new industrial plants and additions with the result that the prevailing demand for all classes of equipment is good and the outlook is promising. Recently large contracts have been closed for equipment for car shops for the Grand Trunk Railway at Battle Creek and the Canadian National Railways has also purchased considerable equipment for the Moncton and St. Malo shops. In addition, a number of smaller orders have been closed for one or two machines for shops in other parts of the Dominion. The Canadian Pacific Railway, while not issuing any large lists has been buying in a small way, chiefly for replacement. Automobile manufacturing concerns are putting their plants in shape for increased operations after the first of the year and buying for replacement purposes as well as for new plants is becoming more active. Inquiries are also making their appearance from some of the large automobile concerns which have plants under way. While there is still a strong demand prevailing for rebuilt and second hand equipment, new lines are steadily coming into more prominence.

Bids will be received until Jan. 15 by R. C. Desrochers, secretary Department of Public Works, Ottawa, for the construction and installation of pumping and other machinery for the dry dock at Esquimalt, B. C. The dry dock which is under construction for the Dominion Government will, when completed, represent an expenditure of approximately \$4,500,000.

The National Meter Co., Ltd., New York, has leased property at 151 Duchess Street, Toronto, and will install machinery and equipment at once for the manufacture of meters, etc.

The Canadian Postel Lock Nut Bolt Co., Ltd., recently incorporated, is preparing to erect a plant at Collingwood, Ont.

The Ontario Shale Brick Co., Ltd., 32 Sun Life Building, Hamilton, Ont., will build a plant there.

The Acme Trading Co., Bank of Montreal Building, Montreal, contemplates the erection of a pulp mill at Three Rivers, Que., to cost \$100,000.

George McIntyre, 7 Burlington Crescent, Toronto, will erect a stone cutting plant to cost \$9,000 and will purchase equipment.

The Ford Motor Co. of Canada, Ltd., Ford, Ont., has awarded the general contract to Wells & Gray, Ltd., Windsor, Ont., for a machine shop to cost \$1,500,000. Contracts for machinery and tools have not yet been placed. The company, however, recently placed contracts with the Westinghouse Co. of Canada for direct current motors. It is the intention of the company to do away with belt drives and has adopted direct motor drive for its entire plant, according to W. R. Campbell, vice-president.

The MacDonald Mfg. Co., 145 Spadina Avenue, Toronto, manufacturers of tinware, etc., has awarded the general contract to Brown & Cooper, 297 Carlton Street, Toronto, for an addition to cost \$100,000.

The Wilkie Products, Ltd., Tillsonburg, Ont., has been incorporated with a capital stock of \$112,000 by William H. Bennett, Edwin I. Torrens of Tillsonburg, Ont.; Leon E. Varnam, Windsor, and others to manufacture pistons, piston rings, machinery, etc. It is asking the city for concessions, in return for which a manufacturing plant will be erected.

John B. Smith & Sons, 53 Strachan Avenue, Toronto, Ont., is in the market for a lathe, 24 to 30 in. swing, 8 ft. long or over, second-hand, in good order.

## STEEL AND INDUSTRIAL STOCKS

### Market Recovers After Reaction—More Stock and Cash Dividend

Following a reactionary trend in the early days of the week, the market in steel and industrial stocks recovered its balance at midweek, and after some hesitancy on Thursday, finished with fairly active trading characterized by general firmness. Such recovery as appeared, however, was but moderate. A few favored issues, chief of which were American Locomotive and Kelsey Wheel, rose even against the general declines, the latter jumping 6½ points on Tuesday's trading. Altogether it has been a year remarkable for its flood of stock and cash dividends, and the movement is still unabated; rather it seems likely that the rush will take on greater impetus owing to the attitude of the radical bloc in Congress in favor of taxing undivided surpluses. The average of 20 industrial stocks is 97.7 against 94.1.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers...	42½	44½	Gulf S. Stl. 1 pf. 100	101	
Allis-Chal. pf....	96	96	Inland Steel.....	40	42
Am. B. S. & Fdy. 73½	75		Int. Har. ....	86½	92
American Can....	69½	73½	Int. Har. pf....	116	116
American Can pf. 110½	111½		Lackawanna Stl. 75¼	78	
Am. Car & Fdy. 180	185		Lima Loco. ....	54¼	58½
Am. Car & F. pf. 123	123		Midvale Steel....	27½	29
Am. Locomotive. 118½	124½		Nat.-Acme ....	12½	13
Am. Loco. pf....	120	122½	Nat. En. & Stm. 63¼	66¾	
Am. Radiator....	117½	120	N. Y. Air Brake 27½	29	
Am. Steel Fdries. 37¾	44½		Nova Scotia Steel 25¼	28	
Am. Stl. Fd. pf....	105	105	Otis Steel ..... 7¼	8½	
Baldwin Loco....	116	124½	Otis Steel pf....	40	40
Bald. Loco. pf....	116	116	Pressed Stl. Car 77	79	
Bethlehem Steel. 60¼	61½		Pressed Stl. pf....	98¼	98¼
Beth. Steel Cl. B 60½	63½		Ry. Steel Spring. 112	113	
Beth. Stl. 8½ pf. 109	111		Ry. Stl. Spg. pf....	115½	115½
Brier Hill.....	14	14	Replogle Steel... 23	25½	
Br. Em. Steel....	9	9	Republic ..... 44¼	47½	
Br. Em. Stl. 2 pf. 26	26½		Republic pf....	83½	84½
Cambria Steel....	40¼	40½	Steel of Canada. 57¼	58½	
Chic. Pneu. Tool 79¼	82½		Superior Steel... 28½	29	
Colo. Fuel.....	24½	26½	Un. Alloy Steel.. 34	34½	
Crucible Steel... 61	66½		U. S. Pipe.....	24¼	24
Crucible Stl. pf....	89½	90	U. S. Steel.....	101	104
Deere pf. ....	72	73½	U. S. Steel pf....	120½	121
Gen. Electric....	178	186½	Vanadium Steel. 33	35¼	
Gt. No. Ore Cert. 30	31½		Va. I. C. & Coke 56	56	
Gulf States Steel 70½	76½		Whouse Air Br.. 99¼	104½	

### Industrial Finances

A new issue of \$4,645,000 Dominion Iron & Steel Co. consolidated mortgage 5 per cent bonds is being offered by Hayden, Stone & Co. at 85 and interest, to yield the investor 6.46 per cent. These bonds are guaranteed both as to principal and interest by the Dominion Steel Corporation, Sydney, N. S., and are due September 1, 1939. Application will be made to list the bonds on the New York Stock Exchange. The present issue is secured by a direct mortgage on the entire property, subject only to the closed issue of \$5,741,000 first mortgage bonds. The net tangible assets after reserve for depreciation and depletion and including only a nominal sum against the large ore holdings equal \$3,340 for each \$1,000 mortgage bond outstanding. For the past 10 years and nine months the yearly average of net earnings after depreciation and deflation was 3½ times the present interest requirements of all mortgage bonds.

The Dominion Iron and Steel Co., Ltd., Sydney, N. S., has sold \$4,645,000 bonds to bankers, who, in turn have resold the issue to investors. The bonds are a consolidated 5 per cent mortgage, dated June 1, 1909, and maturing Sept. 1, 1939.

Announcement is made by the Waterbury Rolling Mills, Inc., Waterbury, Conn., of an increase in the capitalization from \$200,000 to \$600,000. No new plant improvements are contemplated, the increase in capitalization being simply a readjustment of assets.

On Sept. 30 last the American Steel Foundries Co. had \$3,401,127 cash on hand, or \$2,438,972 more than on Jan. 1. Its total quick assets were \$19,684,109, while its total quick liabilities were \$5,660,451, leaving a net working capital of \$14,023,658, contrasted with \$13,125,542 on Jan. 1.

Through banking interests, the New Process Gear Co., Inc., Syracuse, N. Y., offers for investment \$2,000,000 first mortgage 6½ per cent serial bonds maturing \$200,000 each in one to ten years. The bonds constitute a first mortgage on the company's land, buildings, machinery and equipment.

The Richardson and Boynton Co., Dover, N. J., heating apparatus, has sold \$1,000,000 15-year 6½ per cent sinking fund bonds dated Dec. 1, last, to bankers, who in turn are making a public offering. Funds derived from the sale of these bonds are to be used for expansions and improvements of plants and for other corporate purposes.

# Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

## Iron and Soft Steel Bars and Shapes

<b>Bars:</b>	
Refined iron bars, base price.....	3.04c.
Swedish bars, base price.....	7.50c.
Soft steel bars, base price.....	3.04c.
Hoops, base price.....	4.39c.
Bands, base price.....	3.84c.
<b>Beams and channels, angles and tees</b>	
3 in. x ¼ in. and larger, base.....	3.14c.
Channels, angles and tees under 3 in. x ¼ in., base.....	3.04c.

## Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger.....	3.10c.
(Smooth finish, 1 to 2½ x ¼ in. and larger) ..	3.30c.
Toe-calk, ½ x ¾ in. and larger.....	4.15c.
Cold-rolled strip, soft and quarter hard..	6.75c. to 7.25c.
Open-hearth spring steel.....	4.00c. to 6.00c.
<b>Shafting and Screw Stock:</b>	
Rounds.....	3.90c.
Squares, flats and hex.....	4.40c.
Standard cast steel, base price.....	15.00c.
Extra cast steel.....	18.00c.
Special cast steel.....	23.00c.

## Tank Plates—Steel

¼ in. and heavier.....	3.14c.
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## Sheets

### Blue Annealed

	Per Lb.
No. 10.....	4.19c.
No. 12.....	4.24c.
No. 14.....	4.29c.
No. 16.....	4.39c.

### Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20.....	4.30c. to 4.55c.	.....
Nos. 22 and 24.....	4.35c. to 4.60c.	5.00c.
No. 26.....	4.40c. to 4.65c.	5.05c.
No. 28.....	4.50c. to 4.75c.	5.15c.
No. 30.....	4.75c. to 5.00c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher.

### Galvanized

	Per Lb.
No. 14.....	4.60c.
No. 16.....	4.75c.
Nos. 18 and 20.....	4.90c.
Nos. 22 and 24.....	5.05c.
No. 26.....	5.20c.
No. 27.....	5.35c.
No. 28.....	5.50c.
No. 30.....	6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

## Welded Pipe

Standard Steel		Wrought Iron	
Black	Galv.	Black	Galv.
½ in. Butt... —50	—42	½ in. Butt... —11	+13
¾ in. Butt... —55	—44	¾ in. Butt... —17	—1
1-3 in. Butt... —57	—44	1-1½ in. Butt... —20	—2
2½-6 in. Lap... —54	—41	2 in. Lap... —14	+2
¾ in. Lap... —50	—26	2½-6 in. Lap... —18	—2
9-12 in. Lap... —46	—25	7-12 in. Lap... —10	+6

## Steel Wire

	Per Lb.
<b>BASE PRICE* ON NO. 9 GAGE AND COARSER</b>	
Bright basic.....	4.75c. to 5.00c.
Annealed soft.....	4.75c. to 5.00c.
Galvanized annealed.....	5.40c. to 5.65c.
Coppered basic.....	5.40c. to 5.65c.
Tinned soft Bessemer.....	6.40c. to 6.65c.

\*Regular extras for lighter gage.

## Brass Sheet, Rod, Tube and Wire

### BASE PRICE

High brass sheet.....	19½c. to 20½c.
High brass wire.....	20 c. to 21 c.
Brass rod.....	17 c. to 18 c.
Brass tube, brazed.....	26¾c. to 27¾c.
Brass tube, seamless.....	23 c. to 23½c.
Copper tube, seamless.....	25¼c. to 26 c.

## Copper Sheets

Sheet copper, hot rolled, 24 oz., 22c. to 23c. per lb. base.  
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

## Tin Plates

Bright Tin		Coke—14-20	
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Primes	Wasters
IC.. \$10.00	\$8.50	80 lb.. \$5.80	\$5.55
IX.. 11.50	10.00	90 lb.. 5.90	5.65
IXX.. 13.00	11.25	100 lb.. 6.00	5.75
IXXX.. 14.25	12.50	IC.. 6.15	5.90
IXXXX.. 16.00	14.00	IX.. 7.15	6.90
		IXX.. 8.15	7.90
		IXXX.. 9.15	8.90
		IXXXX.. 10.15	9.90

## Terne Plates

8-lb. coating, 14 x 20

100 lb. ....	\$7.00
IC .....	7.25
IX .....	7.50
Fire door stock .....	9.00

## Tin

Straits pig .....	40c.
Bar .....	45c. to 50c.

## Copper

Lake ingot .....	15¼c.
Electrolytic .....	15 c.
Casting .....	14¼c.

## Spelter and Sheet Zinc

Western spelter .....	8¼c.
Sheet zinc, No. 9 base, casks.....	10¼c. open 10¼c.

## Lead and Solder\*

American pig lead .....	8c. to 8¼c.
Bar lead .....	9c. to 10c.
Solder, ½ and ½ guaranteed.....	27¼c.
No. 1 solder .....	26c.
Refined solder .....	23¼c.

\*Prices of solder indicated by private brand vary according to composition.

## Babbitt Metal

Best grade, per lb.....	75c.
Commercial grade, per lb.....	35c.
Grade D, per lb.....	25c.

## Antimony

Asiatic .....	7¼c. to 8¼c.
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## Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb....	25c. to 27c.
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## Old Metals

The market is more active and values are firm. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible .....	12.00
Copper, heavy wire .....	11.50
Copper, light and bottoms.....	9.50
Brass, heavy .....	6.50
Brass, light .....	5.50
Heavy machine composition .....	8.75
No. 1 yellow brass turnings.....	7.00
No. 1 red brass or composition turnings.....	8.00
Lead, heavy .....	5.75
Lead, tea .....	4.50
Zinc .....	4.50



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